

Medicaid Program Evaluation

Working Paper

Medicaid Program Evaluation

Final Report
Cluster II:

MPE Paper 3.8

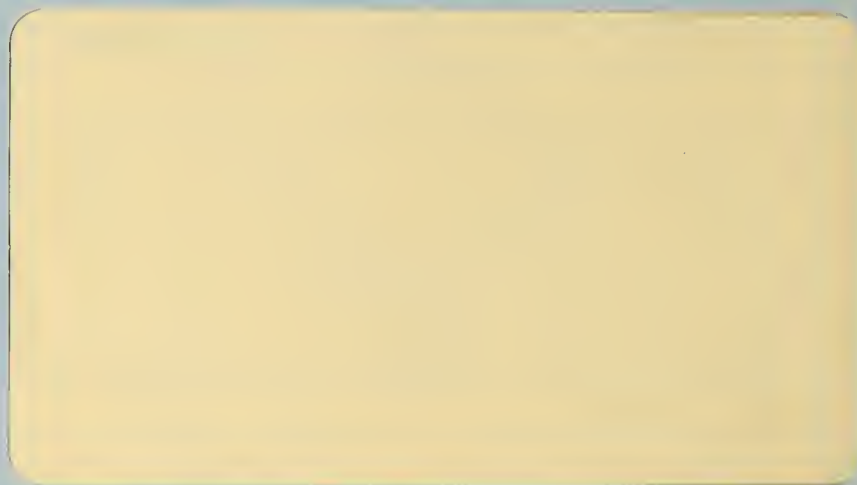
November 1987

INPATIENT HOSPITAL REIMBURSEMENT

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Department of Health and Human Services
Health Care Financing Administration
Office of Research and Demonstrations

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PREFACE

The Medicaid program, which finances health care for over 20 million needy Americans, has undergone major changes since 1981. Beginning with the Omnibus Budget Reconciliation Act of 1981 (OBRA), Congress gave the States much more flexibility to change basic parameters of the program, including which groups of people are served, which services are provided, how doctors, hospitals, and nursing homes are paid, and how care can be organized in innovative ways.

The Medicaid Program Evaluation addresses the implementation and impact of selected changes in the Medicaid program to provide knowledge for policy assessment and future legislative change. It is focused on selected issues and policy questions raised by recent legislation. The three-year evaluation includes nine major study areas:

- Federal Financial Participation
- Inpatient Hospital Reimbursement
- Eligibility
- Case Management
- Home and Community-Based Waiver Program
- Cost-Sharing
- Financial Incentives for Family Care
- Medicare PPS Effects on Medicaid and
- Synthesis.

Together these studies are intended to describe how recent changes have been implemented and analyze what their effects have been for program services and costs.

This document presents the final report of the Inpatient Hospital Reimbursement study area. It addresses an area of great interest to policy makers because hospital inpatient reimbursement accounts for about one-quarter of all Medicaid program expenditures. The study reported here examines the ways in which government can alter the incentives for hospital utilization, costliness, and the quality of care. The experience of innovative state programs is presented as a resource for future policy debate.

EXECUTIVE SUMMARY

Background

The Omnibus Budget Reconciliation Act of 1981 (OBRA) marks a watershed in the reimbursement of hospitals for inpatient care provided to Medicaid recipients. Prior to OBRA, federal law maintained two basic requirements that limited state latitude in designing reimbursement schemes: except for demonstration states that obtained (with difficulty) special waivers from the general requirements, states were required to reimburse hospitals based on hospitals' actual costs, under terms that preserved beneficiaries' freedom of choice. As hospital costs soared--partially in response to cost-based reimbursement--state Medicaid programs had little leeway to lower unit costs or to direct patients to less expensive hospitals.

OBRA changed these requirements and represented the most radical changes in Medicaid reimbursement since the program began. States were given the latitude both to design alternative reimbursement systems that did not use cost-based principles and to obtain waivers from the freedom of choice provisions. With these two grants of authority, OBRA released the states to engage in an extended experiment on different ways to contain the cost of inpatient care. The states responded vigorously. The Health Care Financing Administration sought in turn to assess the impact of what the states had done.

Medicaid Program Evaluation: Hospital Inpatient Project

The Medicaid Program Evaluation (MPE) is a comprehensive study of the many areas of health care funded by Medicaid. HCFA has sponsored this evaluation with assistance from several contractors.¹ The report which follows is concerned with the Hospital Inpatient Project of the MPE. The

Project has followed two different strategies. First, as summarized in Chapter 1, the Project examined national trends and the experience among states pursuing widely varied reimbursement approaches. This examination used standard HCFA data series on hospital costs to determine whether lower rates of expenditure increase were associated with identifiable attributes of alternative Medicaid reimbursement systems. Second, as described in Chapters 2 and 3, the Project also examined in varying detail the experience of states pursuing two of the most innovative alternatives: selective contracting (in California and Illinois) and DRGs (in New Jersey and Pennsylvania).

Analyses of National Trends

Together, these evaluations provide a fairly complete picture of how states responded to OBRA, and with what results. The vigor of the state response is obvious: compared to where they were in 1981, all but eight states had significantly changed their Medicaid hospital reimbursement programs by 1985. The trend has been to replace cost reimbursement with prospective payments based upon some standard external to the individual hospital such as the average costs of peer hospitals, trends in input prices, or the industry average cost of treating a particular diagnosis. Under a prospective payment system, for example, a hospital is given a certain per diem rate which remains fixed for, say, the next year. The hospital can make (or lose) money depending on whether it keeps its costs below (or above) this rate. Prospective systems work in a variety of ways by fixing in advance the

¹Other evaluations focus on alternatives to long-term care, the results of eligibility changes, and examples of primary-care management systems, among other aspects of the OBRA changes.

rate of payment per day or per admission with various possible adjustments for unanticipated changes in patient volume.

The movement toward new reimbursement systems has been paralleled by a reduction in the rate of increase in Medicaid hospital expenditures nationwide. The most important finding: states which initiated alternative reimbursement programs experienced lower rates of hospital expenditure growth than did states which made no changes in their programs. It is also clear that states used the flexibility provided by OBRA to choose payment systems tailored to their particular circumstances and state policy.

Innovations in Hospital Reimbursement

Among the prospective reimbursement approaches taken by the states, two methods were particularly innovative: selective contracting and DRG-based systems. These two approaches were closely examined by this project, both to understand problems of implementation and administration of the two approaches (in four states) and to determine the financial and other effects the two approaches seemed to have (in two states).

Selective contracting is attractive from a theoretical perspective. The threat of loss of business is used to stimulate hospitals to declare prices which reflect efficient behavior. With this information, the state can avoid much of the complex methodology required for the state to determine efficient prices, as under other prospective methods. Selecting contracting thus departs completely from all other prospective payment approaches. Absent are the intricate calculations necessary to derive payments from data on historic costs of the hospital or industry. A selective contracting process can be used to establish any type of rates (per case, per DRG, per diem, per capita). California was chosen for our impact evaluation of selective

contracting because it was the first such system to be implemented. California's experience with selective contracting so far is encouraging. It has led to lower payment rates without apparent problems in quality of service, or adverse practice patterns. Case studies were conducted in both California and Illinois, although the Illinois findings were necessarily limited as that state's experience is too recent for systematic impact evaluation.

There are caveats, however, about the generalizability of the California experience. First, California may have been successful in part because of its many high-cost/low-occupancy-rate hospitals: hospitals were hungry for the otherwise marginal Medi-Cal business. Indeed, our analysis finds that hospitals with large Medi-Cal business were the most likely to get contracts. The conditions for success may become more difficult to achieve in subsequent negotiations in California or in other states. Hospitals may also be forced to bid higher rates over time as bidding is viewed as a permanent program feature. This may lead to a higher proportion of hospitals preferring not to treat Medicaid patients and not participate in the bidding process. To date, however, hospitals seem eager to win Medicaid contracts.

The attraction of most prospective pricing systems is that, by fixing rates at average operating costs, they stimulate efficiency increases through the promise of "profit" to hospitals that achieve favorable cost differential between the "average" rate and their own costs. Of these, DRG-type systems are advocated because they put the hospital at risk for controlling length of stay and because such rates achieve better equity for hospitals by making a direct adjustment for casemix variation over time and across hospitals. New Jersey was selected for our impact evaluation because it was the earliest DRG system to be implemented. The all-payer DRG system in New Jersey reduced the real costs of Medicaid hospital care on both a per day and per admission

basis. Admission rates rose, however, counteracting the unit cost savings--an important lesson to other states that have chosen this method. In addition to hospital admission incentives, the increase in admissions may be attributable to New Jersey's desire to provide partial coverage of bad debt, making hospitals less careful about screening patients for ability to pay.

Unlike selective contracting, a DRG system in principle may reap increasing savings over time: savings are achieved by controlling the rate of increase in rates or by rebasing the rates. Which system is more successful in containing costs over the long run is an open question, until we have a long run to analyze. The relative success of the two approaches will depend on how successful selective contracting systems are in obtaining lower prices in subsequent bidding efforts versus how aggressive DRG systems are in recapturing the efficiencies generated by the payment system incentives.

Selective contracting is administratively less burdensome than a DRG system in that states can ask for bids in the form of an all-inclusive rate (per diem or per case) rather than having continuously to fine tune and periodically to revise rates and reimbursement rules. The negotiation phase currently operating in the California system imposes some burdens on all parties and may result in a situation where relative bargaining skill becomes an important determinant of the outcome. A system of routine bidding via a sealed bid would certainly ease the administrative burden and might result in improved prices for Medicaid.

One final issue that confronts all hospital pricing systems is how to structure the system to achieve non-financial goals such as convenient access to care for the poor and acceptable quality of care for the rich and poor alike. DRG and selective contracting systems become more complicated as these other goals get added to the formulas for setting DRG rates or for selecting

bidders. However, these complications are common to all hospital payment systems, and they do not appear to be a major problem to be accommodated by these new payment approaches alone.

Empirical Analyses

This project undertook extensive empirical analyses of the California Selective Contracting program and the New Jersey DRG program. Our choice of focusing our analyses on these two states was based upon the availability of data and the fact that these two states were leaders in implementing these two approaches. In both states, we examined changes which occurred in patient casemix, utilization, Medicaid inpatient expenditures, substitution between inpatient and outpatient care, quality of care, and the impact of the reimbursement program on hospital operations and finances. For California, an analysis was also conducted on how likely a hospital was to win a contract given its financial circumstances, location, service capabilities, and previous dependence on Medicaid revenues. The financial consequences of being a winner were also explored. For New Jersey these were not issues since all hospitals participated in the DRG program.

For both states, a period before the start of the new payment method was compared with a subsequent period. This approach differed in the two states because of data availability and timing issues.

For California, a one-week sample (January 21-27) of hospital admissions and outpatient visits before hospital contracting (1983) were compared to admissions and visits during the same week after contract implementation (1984). The sample consisted of a total of 12,611 admissions and 76,613 outpatient visits during the two one-week time periods. Claims were limited to hospitals that were eligible for contracting. Certain specialty,

children's and federal hospitals were exempt from contracting as well as hospitals in areas where contracting was not in effect.

The claim sample examined has several strengths. First, the sample is large enough to detect statistically significant differences between the pre-contracting and post-contracting periods. Second, the sampling periods allow us to compare periods that are likely to be free of transitory disturbances. The pre-contract week occurs one month before the start of the selective contracting process while the post-contracting period week occurs almost one year after contract implementation. Third, by comparing the same weeks, our data are free of any seasonal fluctuation in utilization. This sample of claims was linked with California death certificate data to determine post admission mortality experience. California hospital cost reports and other administrative reports were also examined.

The State of California has not revealed the rates which it pays to individual hospitals under selective contracting. However, it does reveal program expenditures and utilization by hospital. Our approach has been to examine Medicaid expenditures per admission, per day, etc. to estimate the effect of the selective contracting program on Medicaid rates paid to hospitals.

For New Jersey, our analyses focused on a comparison of the years 1979 and 1983. The year 1979 was chosen as the "pre" period because this is the last year in which all hospitals in the state operated under the SHARE reimbursement system. The DRG program was implemented in phases beginning in January 1980. Consequently, 1983 was chosen as the "post" period because it was the first year in which all hospitals operated under the DRG program. In the intervening years, hospitals were gradually being phased out of SHARE and into the DRG program.

A second reason for focusing on 1979 versus 1983 is that hospital cost report data (the SHARE forms discussed below) are sparsely filled out and probably unreliable for the period from 1980 through 1982. (Cost reports for these years had little relevance to actual reimbursement rates due to the transition from SHARE to the DRGs.)

Two primary sources of data are used for the analysis in this report. Both are available from the Health Research and Educational Trust of New Jersey (HRET), which is a part of the New Jersey Hospital Association. One source is the New Jersey Department of Health SHARE forms (hospital cost reports). Information from the forms from 1979 through 1983 was used to form a panel of data in which we tracked approximately 90 hospitals over the five year period. One unfortunate characteristic of these cost reports is that they are not consistently filled out in every year. This occurs because a hospital's actual costs were not as important in the years after the implementation of the DRGs.

The other source of data is the HRET annual Payer Summary Files, which were generated by HRET by aggregating patient claims to the hospital level. These files contain information on utilization, length of stay, patient status, and type of payer broken down by individual DRGs. Thus we can track the number of patients in a particular DRG admitted to a particular hospital, along with their length of stay and discharge status. Files obtained for this analysis were payer summary files for 1979, 1982 and 1983.

Other data were obtained from the American Hospital Association, the New Jersey Department of Health, and the New Jersey Department of Human Services, Division of Medical Assistance and Health Services. This included statistics on the Medicaid program and information on hospital ownership, teaching status, location, and other relevant hospital characteristics.

Casemix

In regard to casemix, our analyses of claims in both California and New Jersey found no material changes in the proportions of Medicaid patients with various diagnoses. This result was surprising because both states used reimbursement systems which offered implicit incentives for selecting admissions. In California, the state paid each hospital its own negotiated per diem rate with no adjustment for casemix. In New Jersey, DRG rates were determined by a "blended" formula which considered both statewide average costs and hospital-specific costs. Hospitals with costs for a particular DRG which were above the state average found their DRG payment to be somewhat less than their cost although this discrepancy was muted by basing the reimbursement partly on the hospital's own cost. One might expect that hospitals in either system would have tried to discourage admissions or shorten lengths of stay for cases where the margin between reimbursement and cost was unfavorable. This generally did not happen even though we found a few situations where some hospitals achieved minor adjustments in their casemix.

Utilization

In regard to hospital utilization, we found that the selective contracting program in California achieved very different results than the DRG program in New Jersey.

The New Jersey program offered strong incentives to decrease length of stay and increase admissions because payment was fixed for most admissions. (There were liberal definitions of "outlier" cases which were exempt from the basic DRG.) We examined hospital admissions for 54 hospitals consistently reporting data in the two periods and found that average LOS in New Jersey declined by 15 percent following the introduction of DRGs. However, total

patient days declined by only 4 percent because there was a large offsetting increase in patient admissions of about 16 percent.

In California, results were much less dramatic because each hospital was paid a flat per diem. Examination of our sample of Medi-Cal claims showed that average LOS fell by 2 percent, admissions rose by 5 percent and patient days rose by 4 percent following the introduction of selective contracting.

It is important to note here that a flat per diem payment is not intrinsic to the idea of selective contracting. California adopted a flat per diem and experienced relatively small adjustments as a consequence.

Inpatient Expenditures

Both New Jersey and California experienced reductions in Medicaid program expenditures, but for very different reasons. In California, there was a 16 percent reduction in total expenditure in real dollars in the first year following selective contracting as measured by our sample of Medi-Cal inpatient claims. This was achieved largely through price concessions negotiated with the winning hospitals as shown by a 19 percent reduction in payments per day and a 21 percent reduction in payments per admission. These price concessions were the consequence of a competitive situation where hospitals were reluctant to risk the loss of Medi-Cal business. After 1984, California's aggregate contract expenditures remained essentially unchanged because all hospitals were held to their negotiated rates.

In New Jersey, the DRG program experienced a reduction in total expenditures between 1979 and 1983 of 7 percent as measured by the cost reports of hospitals reporting consistent data. New Jersey's reduction in total expenditures was due largely to a decline of 12 percent in the number of Medicaid eligibles. This decline was due to factors unrelated to the DRG

reimbursement system, namely changes in eligibility instituted by OBRA and TEFRA legislation.

The New Jersey program did experience a decline in LOS of 15 percent but this was largely offset by an increase of admissions of 16 percent. We estimate that total Medicaid expenditures would have increased by 6 percent under the DRG program had it not been for the fortunate reductions in eligibles.

Outpatient Substitution

Our study also explored the impacts of changes in hospital inpatient reimbursements on outpatient visits. One might expect that a hospital would avoid inpatient admissions in cases where the reimbursement is low relative to cost and outpatient treatment is medically feasible. Where inpatient reimbursement is relatively generous, the opposite would occur.

To explore this issue in New Jersey, we examined changes in outpatient visits, inpatient admission, and the proportion of all inpatient admissions coming from the emergency room. This was done for 54 hospitals which filed consistent data for both 1979 and 1983. The hospitals match the distribution of all hospitals in the state. We found that the average number of admissions per hospital arising from the emergency room rose from 19 percent in 1979 to 33 percent in 1983. This suggests that hospitals tended to hospitalize more emergency cases "for observation" under DRGs than they had previously. This approach to care should have been profitable to a hospital if the ER case had a length of stay that was relatively short. We also found that both inpatient admissions and outpatient visits both grew over this period but inpatient

admissions grew about one and one half times as fast. Again, this suggests that medical practice looked more favorably on hospital admissions given DRG reimbursement.

In California, in contrast, there was virtually no change in inpatient admissions relative to outpatient visits. This seems to have been due to the flat per diem reimbursement structure--and the lower rates--adopted by MediCal under selective contracting. Hospitals were offered no financial incentive to substitute inpatient care for outpatient visits. A contributing factor may be the California utilization review program which has a reputation for stringently monitoring admissions and length of stay.

Quality of Care

Reductions in hospital reimbursement have the potential to reduce resources and compromise the quality of care. Information on hospital mortality and discharge patterns were examined in both states to determine if there had been adverse outcomes.

To examine the effects of New Jersey's DRG program upon the quality of care, this project conducted an intensive case study in New Jersey to learn about the perceptions of health care providers, state officials, and consumer groups regarding changes in quality which they believe may have occurred as a result of the DRG program. From this vantage point, we found no hard evidence or consistent perception of quality deterioration. (Koetting, Korda, and Olinger, 1985)

In addition to the case study work, we analyzed preliminary data on hospital mortality which were also being analyzed for HCFA by Abt Associates under the National Hospital Rate Setting Study (NHRSS). We will briefly describe here the methodology of that study and its relationship to our

evaluation of the DRG system in New Jersey. We will also present some preliminary statistics developed by the NHRSS comparing New Jersey with other states. The preliminary statistics and analyses developed by the present study do not reveal any adverse effect. Final data analysis by the NHRSS project is still in progress.

The NHRSS is concerned with determining the impact of hospital prospective reimbursement (PR) programs. These programs have the common feature that they pay a hospital at a rate which is fixed in advance of the delivery of care. The New Jersey DRG program is one example of a PR program; in other states the payment rate may be fixed on the basis of a day of care, or an admission without necessarily taking into account the diagnostic classification system used by the New Jersey program.

Examination of the quality of care in the NHRSS focuses on the dimensions of structure, process and outcome. Research to date suggests that there may be little potential for detecting adverse effects of rate setting programs across all patients simply because of the complexity of the health care process. To detect adverse affects, the research focused on areas of care where rate setting is most likely to have had an impact on the allocation of resources in a manner which might affect patient health status.

For this reason, the NHRSS has used panels of physicians and administrators to identify "care sensitive" conditions -- conditions felt to be especially sensitive to hospital administrative and policy actions and therefore especially sensitive to the effects of rate setting. The panels identified 76 care sensitive classes of cases which in turn were aggregated into 59 "urgent care" diagnoses, and 8 "elective surgical procedures". By tracking mortality rates in these categories, it is likely that any adverse impacts of a reimbursement system upon patient outcomes in care sensitive areas of hospital care can be detected.

The NHRSS sampled data from U.S. hospitals. The hospital sample consisted of: 1) all hospitals in the 15 prospective reimbursement states with median length of stay of 15 days or less and; 2) a 25 percent random sample of all hospitals in the continental United States, outside the 15 PR states, with median length of stay of 15 days or less. Within the sampled hospitals, the NHRSS collected data on patient mortality from HCFA's 20 percent MEDPAR file. This file contains data on each hospital stay for all Medicare beneficiaries having social security numbers ending in 0 or 5. The MEDPAR data set includes basic demographics (age,sex,race), principle diagnosis or procedure, days of care, status at discharge (dead or alive), as well as other information on length of stay and resource utilization.

The present project compared standardized mortality rates for New Jersey with 36 control states which were not subject to prospective reimbursement programs for the period from 1974 to 1983. The rates are computed as the actual mortality rate divided by the expected mortality rate times 100; that is, they represent the percentage by which the actual rate differs from the expected. The rates are reported for all diagnoses, urgent care diagnoses, and elective surgery.

To determine if any differences in mortality rates were statistically significant, we undertook regression analyses for each mortality category. The standardized mortality rates were regressed on 1) a dummy variable for New Jersey, 2) a dummy variable for New Jersey in the years after the implementation of the DRG program. No significant differences were found in New Jersey for the periods before and after the implementation of the DRG program. The regressions confirmed that over time there was a statistically significant decline in mortality (at at least the 90 percent level of confidence) in both New Jersey and the control states over the period from 1974 to 1983. This was

true for all diagnoses, urgent care diagnoses, and elective surgery. The regression for all diagnoses confirmed our impression that New Jersey has historically had a higher mortality rate than the control states. However, none of the regressions showed any significant differences in mortality in New Jersey after the implementation of DRG compared to the pre-DRG period.

Our results should be interpreted cautiously due to the high level of aggregation in the data. A more refined analysis of this issue is currently being undertaken by the NHRSS.

Our study also considered how the implementation of selective contracting may have affected the quality of care in California hospitals. From a theoretical perspective, selective contracting should have encouraged hospitals to examine their costs, formulate strategies for improved efficiency, and submit bids reflective of discovered economies. However, some hospitals may have misjudged their costs and bid too low by mistake; others may have knowingly bid below cost in a financially ill-conceived strategy to capture market share, or to preserve a commitment to community service, etc. Among those who might have submitted loss-incurring bids, there is the danger that too low a level of reimbursement might have restricted the availability of inputs to a point where patient care was seriously compromised.

To examine possible impacts upon the quality of care, we conducted extensive interviews with consumer groups, providers and regulators; we also examined information on 1) patient disposition, and 2) mortality rates. Patient disposition refers to where patients were situated (back at home, in a nursing home, transferred to another hospital, discharged dead, not yet discharged from hospital) following a hospital admission. Adverse outcomes of selective contracting would be indicated by increases in transfers among contracting hospitals (a possible sign that the originating hospital was unable

or unwilling to continue to treat the patient), increases in the number of deaths in the hospital, increases in the transfers to nursing homes, and by corresponding decreases in discharges to a person's home. Some of these dispositions, of course, do not necessarily mean a deterioration in care. For example, it may be appropriate to discharge a patient to a nursing home rather than to incur a longer hospital stay. However, such a transfer would indicate a change in the hospital's incentive to retain a patient.

Mortality rates within 30 days of admission were also examined overall and in selected categories which were likely to include high proportions of Medicaid patients (e.g., maternity) and where constrained resources might be expected to have an effect on death rates. Since we were comparing 1983 (pre-contracting) with 1984 (post contracting), data from the NHRSS were not available. California death certificate data were linked to our sample of claims to track post-admission mortality.

Virtually no changes in disposition were found among contract hospitals. In general, the majority (about 92 percent) of patients were routinely discharged to their home in both periods. About 1.5 percent of Medi-Cal patients died in the hospital, and less than 1 percent of the patients were transferred to another acute care facility or discharged to a long term care facility. About five or six percent of the patients in this sample remained in the hospital for continued treatment. The discharge distribution among contract hospitals was essentially unchanged before and after contracting.

Not surprisingly, the discharge distribution among non-contract hospitals was significantly different between time periods. Routine discharges declined substantially, by 11 percentage points, from 92 percent before contracting to about 81 percent after contracting. At the same time, there was a significant rise in the proportion of patients discharged to long term care facilities and in the proportion transferred to other acute care hospi-

tals. The result is consistent with selective contracting policy which requires patients in non-contract hospitals to be transferred to contract hospitals after stabilization.

Changes in fatality rates can suggest whether Medi-Cal patients have, in general, experienced serious negative impacts on quality of care under selective contracting; these adverse effects might stem from reduced resource consumption, from poorer access, or from the program's transfer policies for emergency admissions to non-contract hospitals. While death rates in the hospital did not significantly change between time periods, a much better measure of patient outcome is the proportion of patients dying after discharge within a fixed period of time post admission. Mortality rates within thirty days of admission were examined for contract hospitals and non-contract hospitals before and after contract implementation. Mortality rates for patients with selected diagnoses sensitive to changes in hospital practice patterns and maternity-related diagnoses were also examined.

We found no evidence that Medi-Cal beneficiaries experienced adverse impacts under selective contracting. There were no statistically significant changes (at the 90 percent level of confidence) between time periods in the proportion of patients who died within thirty days of admission.

Financial Impacts of Selective Contracting

For California, we examined the financial impacts of selective contracting from two perspectives. First, what were the financial characteristics of the hospitals which were awarded Medi-Cal contracts? Were these hospitals more solvent, better managed, more dependent upon Medi-Cal revenues, larger, or more oriented toward teaching than hospitals which were not selected? Second what were the financial impacts of selective contracting on these

hospitals? Were the Medi-Cal contracts a financial burden or benefit to those hospitals which won them?

To examine these issues, we computed financial statistics for hospitals which were subject to the selective contracting process. All data were obtained from the annual cost reports filed by hospitals in the state. Data for hospital fiscal reporting periods ending in 1982, 1983, and 1984 were examined. These three years respectively embrace the period immediately prior to, during, and after the implementation of selective contracting.

Six financial operating ratios were examined. These were:

Current Ratio (ratio of Current Assets (CA) to Current Liabilities) (CL). This is a measure of basic financial solvency or the ability to meet financial obligations.

Operating Margin (ratio of the difference between Operating Revenues and Operating Costs to Operating Revenues). This is a measure of the "profitability" of current operations in terms of the markup of operating revenues over operating costs.

Debt Ratio (ratio of Total Debt to Total Assets). While increases in this ratio should be viewed with caution by a hospital administrator, the optimal level of this ratio is dependent upon factors such as prevailing interest rates, and the likelihood that debt obligations owed to the hospital will be paid.

Leverage Ratio (ratio of Net Long Term Debt to Total Assets). Again, the optimal value of this ratio is dependent upon prevailing interest rates, the quality of the hospital's accounts receivable, and the extent to which owners may wish to carry debt in order to provide the hospital with operating capital. However, increases in leverage generally should be viewed with caution.

Gift Ratio (ratio of Gifts to Net Revenues). In general, higher values of this ratio suggest that a hospital has income which can act as a subsidy to operating revenues.

Uncompensated Care Ratio (the Sum of Bad Debt and Charity Care divided by Net Revenues). Higher values of uncompensated care are generally a financial drain upon hospital resources. The optimal level of this ratio will vary with the goals of the institution.

We found that mean values for all of these ratios were quite similar for both the contract and non-contract hospitals in all of the reporting periods and that both groups displayed fairly wide variances in all of these measures. Formal statistical tests found no significant differences between contract and non-contract hospitals. These findings suggest that the state did not tend to award contracts to hospitals which were relatively better or worse off financially than other hospitals. Conversely, it suggests that hospitals which were in relatively poor financial condition were not necessarily more likely to make offers to the state which resulted in the award of a contract.

Selection of Winning Bidders

To examine which hospital characteristics were associated with winning a Medi-Cal contract, we undertook a statistical analysis (Probit analysis) which related the probability of winning a Medi-Cal contract to various characteristics of a hospital. Our analysis sought to determine how factors such as prior experience in treating Medi-Cal patients, teaching status, or the financial condition of the hospital may have affected the chance of winning a Medi-Cal contract.

Explanatory variables in the Probit regression included the hospital financial ratios previously discussed. These were included to see if financially stronger hospitals were more likely to be winners of Medi-Cal contracts. Financially stronger institutions might have been expected to be winners because 1) they were better managed and consequently could afford to offer the state a more favorable price and 2) Medi-Cal may have wished to avoid the risk of awarding contracts to financially weak hospitals which might be more likely to default on their contracts. A finding that financially

stronger hospitals were less likely to be winners could be interpreted to suggest that these hospitals were more astute bidders who resisted the temptation to bid below cost. Below-cost bidding is a common mistake made by inexperienced bidders and by organizations which have inadequate information regarding their actual costs.

Explanatory variables in the analysis also included the percent of revenue which a hospital had received from Medi-Cal in the previous year, the hospital's average occupancy rate, and the number of emergency room visits made to the hospital in fiscal year 1983. The first two variables were included as measures of the hospital's potential need for winning a contract. Our earlier case study of California (Koetting and Olinger, 1985) had shown that hospitals with large Medi-Cal volumes or low occupancy rates were particularly eager to win these contracts in order to preserve a source of revenue and to fill empty beds. That is, hospitals with little dependence on Medi-Cal or high occupancy rates would not bid as low as those in the opposite situation.

Other independent variables for the Probit equation was a measure of the availability and relative magnitude of emergency room service and a series of dummy variables describing the hospitals in terms of their peer group, ownership, and service speciality as classified by the state of California. These variables were included in the regression to control for systematic differences which may occur across different types of hospitals.

The Probit regression was estimated using data for hospital fiscal year 1983. This means that the regression is based upon one year of cross sectional data corresponding to the year in which contracts were awarded. The approach assumes that any decisions made by the state about awarding a

contract were based upon the current financial and operational status of the hospital (including, as described, the extent of the hospital's prior Medi-Cal involvement).

The Probit regression reveals that the financial characteristics of the hospitals had no statistically significant association with winning a Medi-Cal contract. In the regression, the Current Ratio, Operating Margin, and Leverage Ratio coefficients are each statistically insignificant at a 90 percent level of confidence using a two tailed test. However, the Debt Ratio was statistically significant (at the 90% level) with a positive coefficient. This finding suggests that the state did favor making awards to more indebted institutions or, alternately, that such institutions more frequently presented offers which were acceptable.

The main factor which explains whether a hospital received a Medi-Cal contract is its past involvement with the program as measured by the percentage of hospital revenues which were derived from Medi-Cal in 1982. In the regression, the coefficient on this variable is positive and statistically significant at the 99 percent level, indicating that hospitals which were highly dependent on Medi-Cal tended to be successful bidders.

For-profit hospitals tended to be unsuccessful in obtaining Medi-Cal contracts. This may reflect the unwillingness of for-profit hospitals to make significant price concessions in the negotiating process. It may also reflect an unwillingness by these hospitals to bid at prices which they might have considered to be below their level of costs.

Our analysis does not show any tendency for teaching hospitals or government-operated hospitals to be more successful than other hospitals at winning Medi-Cal contracts after controlling for the volume of Medi-Cal business.

Hospitals with higher occupancy rates were more likely to be successful bidders. This is indicated in the regression by the fact that the hospital occupancy rate is significant (at the 90% level) and positive in sign. The finding suggests that hospitals with low occupancy rates did not necessarily offer the state the lowest bids or, alternately, that the state was careful about awarding contracts to hospitals with occupancy problems.

The number of hospital emergency room visits had no statistically significant effect on determining which hospitals won Medi-Cal contracts.

In summary, past experience with Medi-Cal was the most important factor which contributed to a hospital winning a Medi-Cal contract. This finding suggests that hospitals with a large volume of Medi-Cal business were reluctant to lose this revenue and they may have consequently offered the state the most attractive bids. Alternately, the results suggest that large volume Medi-Cal hospitals were also the most knowledgeable bidders about the costs of treating Medi-Cal patients. This experience may have given the hospitals an advantage in determining the price which they should offer the state in the negotiation process. Further, the results suggest that the state may have been more inclined to accept the bids of historically large Medi-Cal suppliers, whatever their bid price--a possibility that implies the state refrained from fully exercising its market power as a buyer, as it sought to balance against savings the competing claims of access and availability of service. Since the state has not released any information concerning the bids themselves, it remains a matter of speculation whether the state rejected any bids which were regarded as too low or what selection criteria ultimately prevailed. Such bids might have been rejected if they came from bidders who were relatively inexperienced at treating Medi-Cal patients and thus did not make credible offers.

Effects of Contracts on Hospital Financial Condition

To examine more formally the effect of selective contracting upon hospital financial condition we estimated ordinary least squares regressions using pooled time-series cross-sectional data for the three fiscal years. The data covered both hospitals which won contracts and those which did not. Dependent variables were four financial ratios (Current Ratio, Operating Margin, Debt Ratio, Leverage Ratio) which measure the hospital's financial strength.

To measure the impact of a Medi-Cal contract, we computed the percent of days in which a hospital held a contract in fiscal year 1984. This variable was used as an independent variable in the regressions. (The variable equalled zero for all hospitals in 1982 and 1983; for non-contract hospitals it remains as zero in 1984). This approach allowed us to control for the fact that contracts were phased in at different times across the state. For contract hospitals in 1984, this variable ranged in value from 30 percent to 60 percent for about two-thirds of the hospitals. To control for any systematic time trends, a TIME variable was defined.

Our regressions have very low explanatory ability for the current ratio ($\bar{R}^2 = .035$) and the Leverage ratio ($\bar{R}^2 = .074$) but better ability for Operating Margin ($\bar{R}^2 = .373$) and the Debt Ratio ($\bar{R}^2 = .147$). The number of months with a Medi-Cal contract is statistically significant only in the regressions for Leverage and Debt. In both cases the coefficient is positive, indicating that hospitals which won Medi-Cal contracts tended to have more debt and more leverage during the period of operating under a Medi-Cal contract. The regression indicates that a hospital which operated for a full year with a contract tended to have a debt ratio which was 17 percent higher than a non-contract hospital. (Contract hospitals operating for a full year

under a contract would on average have a debt ratio of 0.76 vs. 0.65 for non-contract hospitals.) For the Leverage ratio, contract hospitals were on average 20 percent higher. For the operating margin and the current ratio, having a contract seems to have a negative impact but the results are statistically not significant.

The increase in debt and leverage (and also the weaker indications that the operating margin and current ratio fell) suggest that hospitals which won contracts did so by accepting lower reimbursement. Hospitals which won contracts were apparently not able, in the period covered by these data, to fully offset the reduced reimbursement with improved operating efficiency.

Thus, the hospitals which won Medi-Cal contracts experienced increased debt during the first year of contracting. There is also some weaker evidence that operating margins and the current ratio were adversely affected. All of this suggests that Medi-Cal contracting resulted in pure price concessions by the hospitals which won the contracts.

Conclusion

In summary, the Medicaid Program Evaluation of Inpatient Hospital Reimbursement examined how the states responded to provisions of TEFRA and OBRA which allowed more flexibility in the design of reimbursement formulas. A majority of the states moved towards reimbursement systems which based payments on economic trends which were beyond manipulation by an individual hospital. This "prospective" type of reimbursement departed sharply from a long history of basing reimbursements on a hospital's actual cost.

Our study particularly examined two emerging approaches to reimbursement: selective contracting and DRGs. California and Illinois have each undertaken selective contracting. Several states are now using DRGs; our

study examined the experience of the most mature DRG program, namely, the one used by New Jersey. We also examined the experience of a more recent DRG program begun in Pennsylvania.

Our specific examination of the selective contracting system in California showed that the state reduced Medi-Cal expenditures mainly through price concessions offered by hospitals. There is no evidence that quality of care was reduced by this process.

Our examination of the New Jersey DRG program found that hospital length of stay fell as a consequence of reimbursement incentives. Hospital admissions also fell but this was due to changes in eligibility since the DRG program itself encouraged more admissions. Again, there is no evidence of adverse quality of care.

We have found that selective contracting could be implemented in tandem with a DRG system simply by asking for bids on individual DRG rates.* This approach might be administratively simpler than current methods whereby DRG rates are based upon a statistical analysis of historical hospital costs. Contracted DRGs might also reflect more accurately the true economic costs of hospitals.

*At this writing, the State of Washington is beginning to use a selective contracting approach to set DRG payment rates for Medicaid.

CHAPTER 1

INTRODUCTION

About one-quarter of all Medicaid expenditures are for inpatient hospital care. These expenditures rose from \$1,012 per year per enrollee in 1975 to \$2,539 in 1984 (Cromwell & Hurdle, 1986, Table 3-1). The annual average rate of growth of 10.8 percent far exceeded the average growth of consumer prices (7.6 percent). Efforts to control hospital costs were begun in many states during the 1970s, but federal participation in these state programs was limited and considered an experimental deviation from the standard program requirements, which continued to stipulate cost-based reimbursement.

The 1981 OBRA legislation gave states greater flexibility and authority over their hospital payment methods, by making it easier for states to adopt alternatives to retrospective approaches of hospital reimbursement. OBRA's flexibility, followed closely by the establishment of Medicare's prospective payment system (PPS), have opened an era of innovation in hospital reimbursement for state Medicaid programs.

Prior to the enactment of OBRA, the Medicaid program was required to reimburse hospitals on the basis of their actual cost of operations in accordance with accounting standards developed by the Medicare program. These accounting rules allowed hospitals to compete for patients and prestige by employing increasing amounts of labor, materials, and capital in producing hospital care. All payors, including Medicaid, suffered from unanticipated high rates of increase in hospital payments.

To counteract these inflationary incentives, prospective rate-setting programs began to be developed early in the 1970's to set a hospital's allowed

reimbursement amount (per day, per admission, or a budgeted amount per year) at a fixed level at the start of a year; the hospital would then be at risk to keep its costs at or below this rate. If the hospital was successful, it would be allowed to retain as profit some of the difference between its costs and the payment rate; if unsuccessful, it would have to absorb some of the difference as a loss. During the 1970s, payors in more than 30 states developed programs of prospective rate setting, which covered at least one major third-party payer of hospital care. Medicaid participated in nine of them under waiver from HCFA. Evaluation of these programs (Coelen and Sullivan, 1981) shows that they were generally successful at reducing the rate of increase in hospital cost inflation by one to three percentage points per year.

The small number of states that undertook these programs during the 1970s reflects a variety of obstacles: initial uncertainty about whether or not prospective reimbursement would be successful, lack of experience in designing and implementing such programs, and the administrative complexities associated with obtaining Medicaid waivers. OBRA (1981) removed a major barrier to states developing more efficient reimbursement systems by eliminating the requirement that their Medicaid programs use Medicare cost-based reimbursement principles to pay for hospital care. Instead, states were allowed to establish reimbursement systems in which the rates they paid:

- were sufficient to cover the costs of an efficient and economically operated facility;
- gave consideration to hospitals serving a "disproportionate" share of poor patients; and
- resulted in overall inpatient hospital spending that is not greater than the amount paid if Medicare reimbursement principles were used.

These legislative changes allowed states a unique opportunity to control a major component of their Medicaid expenditures by developing reimbursement systems with stronger incentives for cost control. Subsequent passage of TEFRA and the adoption of a Diagnosis Related Group (DRG) payment system by Medicare under its Prospective Payment System (PPS) gave further impetus for states to innovate.

The passage of OBRA allowed states greater flexibility in replacing Medicare's cost-based methods. The historical record shows that states rapidly took advantage of the economizing opportunities offered by OBRA (1981) and subsequent legislation. As of October 1, 1985, four years after OBRA, all but eight states had changed their reimbursement systems, most to some prospective payment system. Given the fiscal pressures felt by both the federal and state governments in the early 1980's, the control of spiralling Medicaid expenditures must be recognized as an important but not sole goal of the changes that were made in state Medicaid program policy during that period. With respect to program reimbursement changes, it could be argued that perhaps the easiest and quickest way to reduce program expenditures would be through across-the-board reduction in payment levels. However, to identify the containment of program spending as being the only policy objective that the states and/or the federal government sought to achieve at that time would understate the complexity and difficulty of policy making in this area.

An examination of federal statutory language providing states greater flexibility in their Medicaid hospital reimbursement policies, as well as the characteristics of many of the new reimbursement systems implemented by individual states, indicate that several other objectives, aside from an immediate reduction in bottom line spending, influenced the development of many of the new reimbursement systems. Access to care for indigents and inter

payor equity considerations certainly played an important role on the development of these new systems.

The following objectives of Medicaid reimbursement policies must therefore be kept in mind when examining the overall effects of these new systems:

- Budget Impact: the extent to which the system is expected to achieve short- and/or long-run savings and predictability in year-to-year budgeting.
- Access: the extent to which the system provided Medicaid recipients with proximity to necessary inpatient hospital care.
- Sufficiency: the extent to which the system generates rates sufficient to cover the costs of an efficient and economically operated facility.
- Efficiency: the extent to which the system offers incentives to hospitals to render services as efficiently as possible.
- Distribution Across Providers: the extent to which the systems affect the distribution of Medicaid patient days across individual facilities or classes of hospitals.
- Protection of Hospitals with High Indigent Care Volumes: the extent to which the system provides support to hospitals providing substantial amounts of care to indigent patients.
- Technology: the impact the system has on the proliferation and use of high technology.
- Quality of Care: the impact the system has on the quality of care provided to Medicaid recipients.
- Effects on Other Payers: the extent to which the new system encourages hospitals to shift uncovered Medicaid-related costs to other payers.
- Administrative Feasibility: the extent to which the administrative burden of a state's Medicaid hospital reimbursement policies on both the state and providers is reduced or increased by the new system.
- Acceptability: the extent to which the new systems are accepted by all involved parties including providers,

the federal government through its review/approval process, and the courts.

The case studies of state payment programs we describe in this report will examine the impacts in these areas of the Medicaid reimbursement systems and the extent to which goals other than efficiency motivated program design.

1.1 Hospital Reimbursement Systems

Five major types of reimbursement systems are in effect in state Medicaid programs (state counts current as of October 1, 1985):

Retrospective Cost-Based Reimbursement. This is the system mandated (except with waiver exceptions) prior to OBRA. It was in effect in all but four states in 1977. Basically, this system reimburses a hospital for its actual cost of rendering care as determined by a retrospective audit of costs. (Typically an interim rate is used to pay a hospital throughout the year in which it renders care; a final payment is then made based on the audit.) As noted, only eight states have this system.

Retrospective Cost to Trend Limit. Under this system a hospital is paid its actual costs up to a limit on the allowed rate of increase in the reimbursement rate. There are two variants. One bases the limit on regional or national inflation experience. The second bases it on two factors: the rate of inflation in inputs and the rate of cost increases experienced by other peer hospitals. Eight states and the District of Columbia have a trend-limit system.

Prospective (Base-Trended) Reimbursement. Under this system, a hospital's reimbursement depends upon its costs in a base year plus an allowance for annual inflation. A hospital's actual costs in years beyond the base have no effect on reimbursement. If actual costs are less than the prospective rate, the hospital profits; if actual costs exceed the prospective

rate, the hospital incurs a loss. This system rewards hospitals that keep their costs lower than the allowed trend. Twenty-two states have a base-trended system.

Prospective Flat Rate or DRG System. In principle, hospitals are paid a fixed amount per admission for each case with a particular diagnosis based on industry average costs in a base year, plus an allowance for inflation (though in practice DRG formulae may include an extensive set of hospital-specific components). The fixed rate may vary for particular types of hospitals such as teaching hospitals or those in rural areas. Most Medicaid DRG systems are variations of the Medicare system which pays according to 468 diagnosis related groups (DRGs). On average a hospital should have its costs fully covered by this system, but hospitals can profit or incur losses to the extent that their costs of treatment are lower or higher, respectively, than the industry average. Cases which exceed a defined limit on costliness ("outliers") are reimbursed separately, based on a percentage of costs. Ten states have implemented variants of DRG systems.

Contracted or Negotiated Prospective Rate. Under this system the state tries to negotiate a favorable prospective reimbursement rate, rather than to base rates on historic costs of the hospital or industry. Contract systems may be viewed as variants of competitive bidding except that the systems are often more flexibly negotiated, taking account of more factors, than is typical in a sealed bid situation. This process of determining rates attempts to achieve economical rates by imposing competitive pressures and the risk of losing all Medicaid business. Competitive contracting or negotiation offers states an opportunity to reset the levels of hospital payments, as contrasted with other prospective pricing methods which attempt to control

rates of increase in payments. Four states use this system, often in combination with other techniques.

Figure 1.1 shows the current pattern of reimbursement systems across states. Figure 1.2 shows the timing of the shift. The importance of OBRA in 1981, TEFRA in 1982, and PPS in 1983 is clear, with various forms of prospective payment quickly replacing cost reimbursement as the preferred approach by Medicaid programs.

As illustrated in Figure 1.2, there has been a dramatic shift away from retrospective systems toward prospective systems. States have embraced prospective systems in the belief that they impose a more severe budget discipline on hospitals. More importantly, prospective systems shift many of the risks of cost containment and obligations for utilization review toward hospitals and away from Medicaid.

It is important to bear in mind that factors governing changes in Medicaid programs, however, are much broader than changes in Federal law regulating the programs. Medicaid programs are administered by state governments which have more general responsibilities in the area of health care, including monitoring, and perhaps regulating, health finance issues as they affect the entire population. This dual role for state governments is particularly apparent in the area of hospital reimbursement where Medicaid is just one purchaser of hospital services, and a relatively small purchaser at that (for example, accounting for less than 10 percent of hospital care expenditures nationwide in 1980, just before OBRA (Waldo et al., 1986, Table 10)). How that role as purchaser of hospital services is fulfilled depends to some extent on how the state views its overall role with regard to hospital financial oversight. It is also important to realize that states' aggressiveness about Medicaid cost containment is conditioned by the more general fiscal

Figure 1.1

Medicaid Inpatient Hospital Reimbursement Methods October 1985

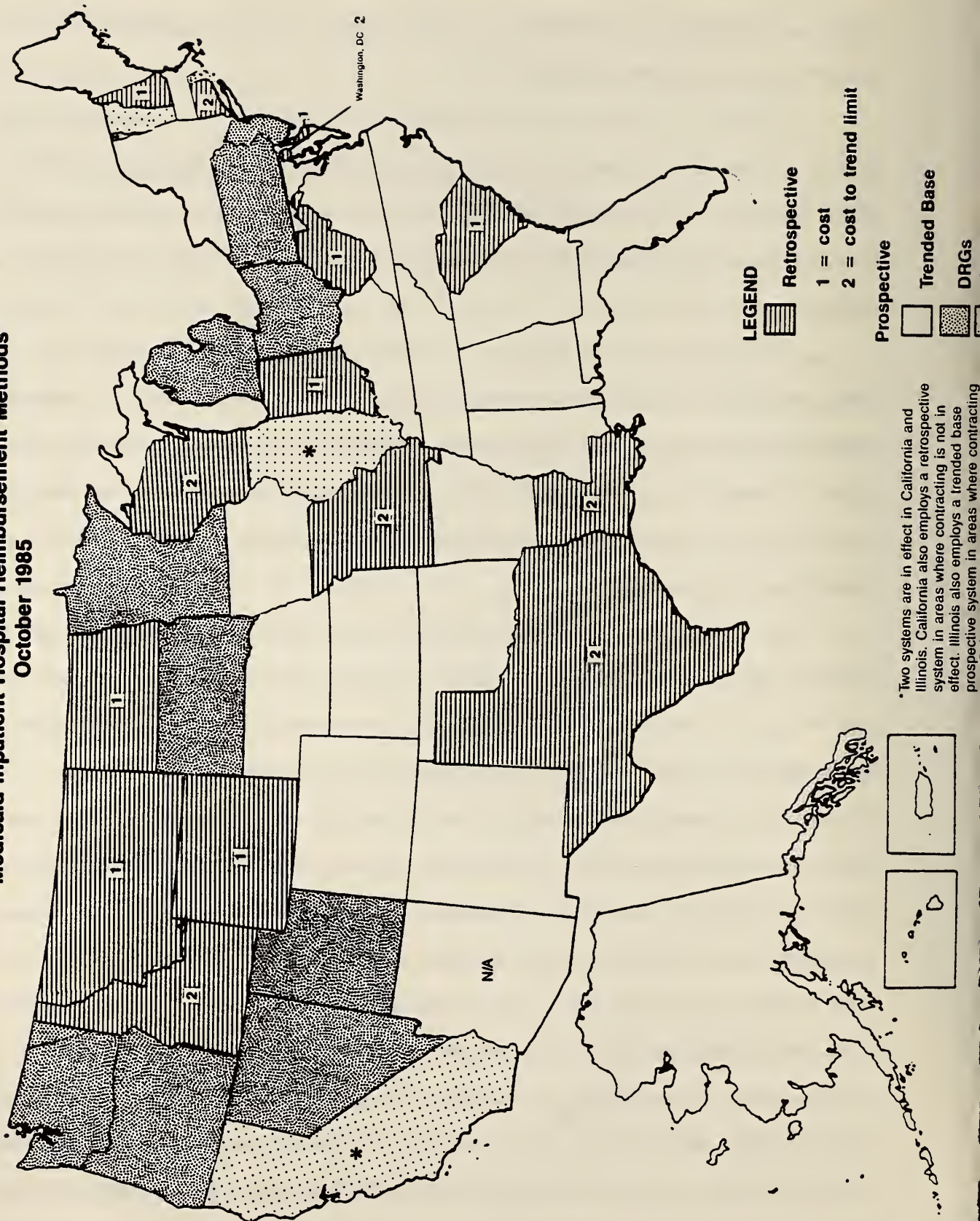
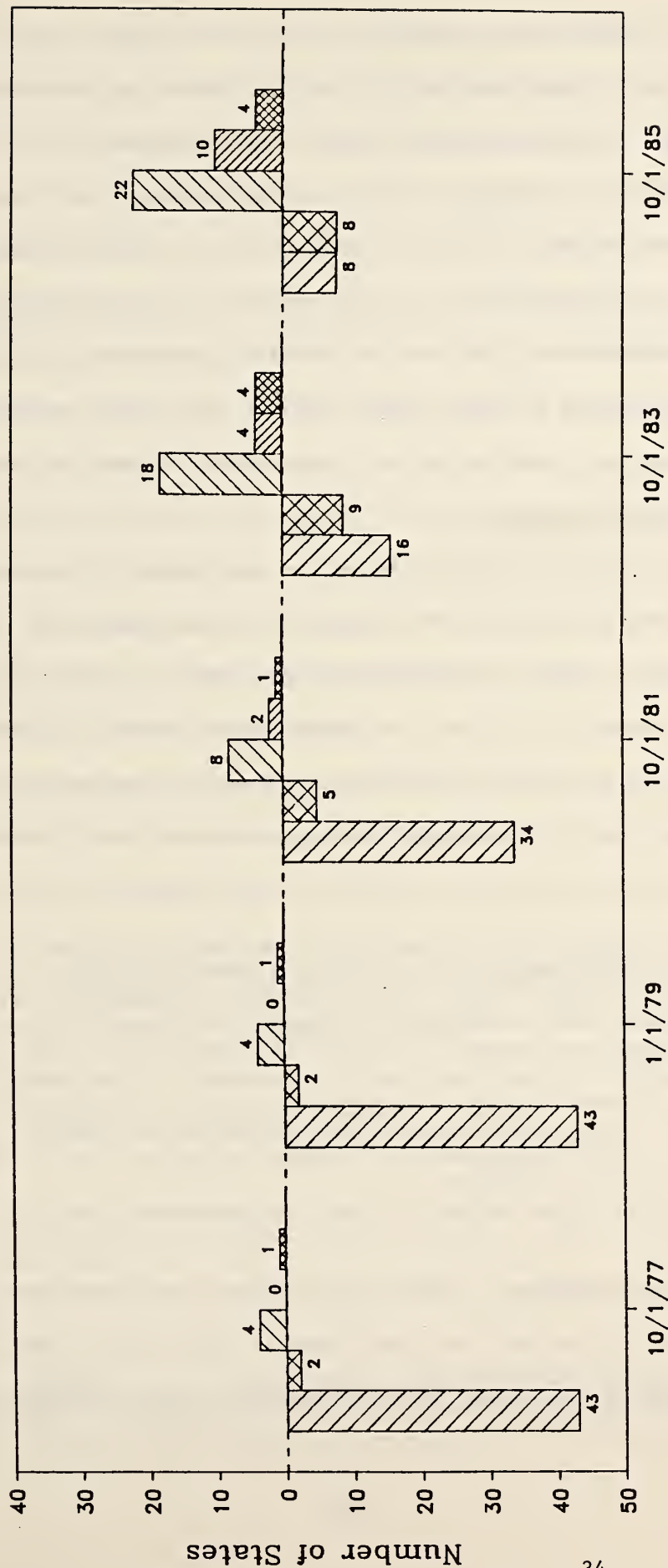


Figure 1.2

PROSPECTIVE HOSPITAL REIMBURSEMENT

Trends in State Medicaid Programs, 1977 - 1985



KEY:

RETROSPECTIVE METHODS

PROSPECTIVE METHODS

- Cost
- Cost to Trend
- Base Trended
- DRG
- Contract/Negotiation

climate in the states--some states have had severe budget crises, others have not--as well as by federal financial participation in the Medicaid program (budget savings in most states are only about 50 percent of the reduction in hospital payments). The size of the state share of inpatient expenditures may force reductions amidst a larger fiscal crisis. However, Medicaid program expenditures, as 50 cent dollars to the states, are less burdensome than most other social programs for the poor and probably represent a preferred type of expenditure (Cohen and Holahan, 1985). These competing considerations yield considerable variety in rate-setting goals, well beyond the implications of federal law alone.

The next section examines the actual experience of the states in terms of their cost inflation under retrospective versus prospective systems. The findings generally support the belief that prospective systems are more effective than retrospective systems at reducing the rate of growth in costs. Subsequent chapters examine the effects of particular programs adopted in selected states and the motives for adopting the new forms of hospital payment.

1.2 National Performance of Prospective Payment Approaches

Two studies were undertaken to examine the degree to which changes in payment approaches altered the rate of increase of Medicaid payments for hospital care. Both utilized annual data submitted by states to HCFA (using SF 2082) for the years 1978-1984.

The first study estimated the effect of prospective payment on Medicaid hospital spending. States were divided into three groups according to reimbursement method pre- and post-OBRA: states using traditional retrospective Medicare reimbursement methods throughout the 1978-1984 study period,

states implementing "early" prospective rate-setting schemes prior to OBRA, and states implementing "late" rate-setting schemes after OBRA's enactment.¹ The late rate-setting schemes are presumably more effective in reducing growth rates of expenditures, since these schemes use OBRA provisions, have the benefit of program design lessons from the earlier program experience in other states, and have more potential slack (or "fat") to exclude than would "early" states.² These lessons include difficulties with volume control in systems that use per diem rates and equity difficulties if some form of casemix adjustment is not made. Growth rates in actual hospital spending, actual hospital spending per patient, and number of patients are shown for the three groups of states in Table 1.1. The table also breaks out results for Medicaid's two major recipient categories: those eligible under the Aid to Families with Dependent Children (AFDC) program and those eligible under the Supplemental Security Income (SSI) program.

All three groups of states experienced lower rates of increase after than before OBRA. As expected, the largest drop in the rate of increase after OBRA and the lowest post-OBRA rate of increase occurred in states which implemented late rate-setting reimbursement systems. These states more than halved their inpatient expenditure growth between pre- and post-OBRA periods. Because the number of recipients of hospital services decreased in the post-OBRA period, expenditure growth reductions were considerably smaller on a recipient basis. Per recipient expenditures decreased the most (38 percent) between the pre- and post-OBRA periods for states with early rate-setting

¹For more detailed description of this research see Cromwell and Hurdle, 1986.

²Note, however, that the level of inpatient expenditures could plausibly be lower in "early" than "late" states, given more years of effort to exact efficiencies in the "early" states than the "late" states.

Table 1.1

AVERAGE ANNUAL GROWTH IN MEDICAID INPATIENT HOSPITAL EXPENDITURES
FOR PRE- AND POST-OBRA PERIODS, BY REIMBURSEMENT SYSTEM

	<u>Expenditures</u>		<u>Expenditures</u>		<u>Inpatients</u>	
	<u>1978-</u>	<u>1981-</u>	<u>Per Inpatient</u>		<u>1978-</u>	<u>1981-</u>
	1981	1984	1981	1984	1981	1984
<u>Average Annual Compound Growth Rates in Hospital Expenditures</u>						
Total U.S.	15.0	7.3	13.7	9.4	1.2	-2.1
Pre-OBRA (Early) Rate-Setting States	14.1	7.2	14.6	9.1	-0.5	-2.0
Post-OBRA (Late) Rate-Setting States	14.9	6.6	13.5	8.9	1.4	-2.3
Medicare Reimbursement States	15.6	8.7	13.5	10.5	-2.1	-1.8
<u>Average Annual Compound Growth Rates in Hospital Expenditures - AFDC</u>						
Total U.S.	14.5	6.2	12.5	8.8	1.9	-2.6
Pre-OBRA (Early) Rate-Setting States	9.4	5.3	9.9	9.3	-0.6	-4.5
Post-OBRA (Late) Rate-Setting States	15.2	5.1	13.0	8.3	2.2	-3.2
Medicare Reimbursement States	16.3	8.7	13.3	9.3	3.0	-0.6
<u>Average Annual Compound Growth Rates in Hospital Expenditures - SSI</u>						
Total U.S.	16.5	7.5	14.5	9.9	2.6	-2.3
Pre-OBRA (Early) Rate-Setting States	17.7	8.1	17.2	9.1	0.5	-1.1
Post-OBRA (Late) Rate-Setting States	15.7	6.6	13.7	9.0	2.0	-2.4
Medicare Reimbursement States	17.5	9.0	14.3	12.1	3.3	-3.1

SOURCE: Cromwell and Hurdle, 1986.

systems and the least (22 percent) for states which retained the cost reimbursement system throughout.

Examining hospital expenditure growth for AFDC and SSI eligibles separately revealed some differences between reimbursement groups on a per recipient basis. AFDC expenditure growth rates per inpatient decreased for states with late rate-setting systems and states that continued to employ traditional cost reimbursement methods. It remained virtually constant between the pre- and post-OBRA periods for states that adopted early rate-setting systems, although the growth rate was low-enough pre-OBRA to remain comparable with post-OBRA growth rates for the other groups. By contrast, the early rate-setting states exhibited a larger decrease in SSI hospital expenditure growth on a recipient basis in the post-OBRA period than in late rate-setting or cost reimbursement states.

The second study (conducted at the Urban Institute) used the same Medicaid hospital expenditure data to analyze the effects of different rate-setting approaches on the rate of growth of Medicaid hospital expenditures.³ States were classified according to whether they controlled only Medicaid rates, Medicaid plus some other payers' rates, or rates paid by all third-party payers. The study also differentiated the Medicaid-only rate-setting systems according to the length of time they had been in place.

The first objective in that report was to distinguish between all-payer, multi-payer, and Medicaid-only systems in their effects on Medicaid outlays. The second objective was to test whether different payment systems (1) had effects which lasted beyond a one-time initial impact and (2) had their effects through reducing the number of recipients rather than services

³For a more detailed description see Zuckerman, 1986.

per recipient. The study used eight years of Medicaid expenditure data, 1977 through 1984. Aged Medicaid patients were excluded because virtually all of these patients are also Medicare eligible; thus, their inpatient hospital utilization and payments will be affected by Medicare reimbursement rules rather than state policy decisions.

In addition to reimbursement policy, states employed a wide variety of controls in their attempts to limit both hospital admissions and lengths of stay, e.g., prior authorization, limits on hospital stays, etc. In order to isolate the effect of reimbursement changes, multivariate analysis controlled for the effect of these other variables, for changes in Medicaid eligibility, and for general trends affecting the hospital sector.

The results shown in Table 1.2 indicate that the all-payer states had statistically significant reductions in hospital spending, averaging 6.1 percent annually. Medicaid-only rate-setting systems had strong effects in the first full year of implementation, averaging a 7.6 percent reduction in the rate of growth of real Medicaid hospital spending; however, the effect did not continue in subsequent years. The implication is that Medicaid-only systems have a strong one-time effect, but then return to the same growth rate they were experiencing prior to the reimbursement change. The lower growth rates of all-payer states continued through the whole analysis period, which went beyond at least the third year of implementation, indicating the likelihood that they are long-term effects. The persistence of the effect on spending over the whole observation period is consistent with other evidence on rate-setting effects when all payers are covered.

The details of the rate-setting systems in the four all-payer states (New York, Massachusetts, New Jersey, and Maryland) suggest that the systems in the first two are more stringent than those in the second two. To see

Table 1.2

EFFECTS OF REIMBURSEMENT CHANGES ON INFLATION-ADJUSTED
 MEDICAID HOSPITAL SPENDING, 1977-1984
 (Annual Percentage Change in Medicaid Spending)

	Hospital Spending	Medicaid Inpatient Recipients	Spending per Medicaid Inpatient Recipient
All-Payer Systems	-6.1**	-1.0	-5.9**
Other Multi-Payer Systems	-5.1	-3.0	-2.8
Medicaid-Only Systems			
First full year	-7.6	-4.2*	-3.9
Subsequent period	-0.5	-0.1	-0.3

**Statistically significant at the .05 level.

*Statistically significant at the .10 level.

whether greater stringency did indeed have greater effects on hospital spending, the average effect for New York and Massachusetts was estimated separately from the average effect for New Jersey and Maryland. As expected, the New York and Massachusetts systems accounted for the effect in the all-payer states, with real hospital expenditure growth declining by 12 percent. This reduction was almost entirely due to a 10 percent reduction in spending per inpatient recipient, rather than a reduction in the number served.

There were no effects on hospital spending growth in states where Medicaid and some, but not all, payers were included in the rate-setting system.

As noted, there were effects in states where only Medicaid was covered, but these were confined to an average reduction of 7.6 percent in the first full year of implementation, slightly more than half of which was due to a reduction in spending per inpatient recipient. That the effect was confined to the first full year in states where rate-setting covered only Medicaid may suggest that states, having successfully achieved a sharp reduction in the growth of hospital spending, may become somewhat less stringent in their application of the new system, for fear of restricting access to hospital care for Medicaid recipients. Even this one-time impact is a significant achievement, because although spending growth returned to its previous rate, levels of spending remained lower.

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1. The first part of the paper discusses the importance of the study of the history of the United States. It is argued that a knowledge of the past is essential for a full understanding of the present and for the development of a sound policy for the future. The author points out that the study of history is not only a means of satisfying a natural curiosity about the past, but also a means of developing a sense of responsibility for the future. He concludes that the study of history is a necessary part of a liberal education and that it should be made a compulsory part of the curriculum of all schools and colleges.

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CHAPTER 2

SELECTIVE CONTRACTING

2.0 Introduction

This chapter examines the experiences of two states which have implemented selective contracting for Medicaid services. California was the first to implement such a system and is now completing its fourth year under the Selective Provider Contracting Program (SPCP). Illinois, following California's lead, instituted the Illinois Competitive Access and Reimbursement Equity (ICARE) program following authorizing legislation passed in 1984. Their first year of operation (1986) recently came to a close.

Selective contracting in these two states came close to being exercises in formal competitive bidding. The states are thus interesting to examine because competitive bidding itself has several attractive properties compared to other approaches to hospital rate setting. Competitive bidding is a commonly used process by which buyers and sellers come to agree on a price. One important property of competitive bidding is that it shifts the "burden of proof" in a rate setting program from the buyer (Medicaid) to the seller (the hospital). Under most rate setting programs the buyer is under political pressure--and often the legal necessity--to justify the proposed hospital rates as being fair and reasonable to the hospitals. Under competitive bidding, as long as the process satisfies modest standards of fairness, hospitals can be presumed in law and in fact to have made offers which reflect their own estimate of reasonable cost. A second property of competitive bidding is that it promotes an active search for economies which are shared between the hospital and Medicaid. In order to win under competitive bidding, a hospital is placed under pressure to identify viable methods of cost savings

and to pass on at least some of these savings to the buyer in the form of a lower bid.

The pressure that hospitals face to obtain cost efficiencies will in part be a function of how the state chooses to exercise the market power it has. The state can of course be a tough negotiating partner. But unlike a private negotiator, the state must recognize the competing claims of a public role. The state can press for cost savings, but not without concern for the financial well-being of hospitals, the access of public assistance recipients to hospitals, the size of disparities with other payers, the political consequences that may follow stringent rates, and so on. These competing claims may prevent the state from extracting all of the savings from hospitals that its market power alone would permit, and thus may reduce to that extent the pressure hospitals face to operate more efficiently.

Both California and Illinois chose to negotiate for substantial savings, as described below. In examining the experiences of these two states, it is also important to remember that selective contracting and competitive bidding are merely methods by which buyers and sellers of hospital services come to agree on a price. The systems described for California and Illinois are both based upon per diem hospital rates. However, other units of payment--such as DRGs--could also have been selected, since any unit of service could be the object of competitive bidding.

2.1 Implementation of Selective Contracting

2.1.1 Implementation in California

Selective contracting in California was a response to a severe budget crisis in the spring of 1982. Faced with a \$2 billion-dollar deficit in the state budget, the state exercised its authority provided by OBRA of 1981 to

limit freedom of choice and to implement an alternative hospital reimbursement system.¹ A selective contracting statute providing extraordinary powers to the executive branch was passed by the legislature with unprecedented speed and bipartisan support--a result manifestly difficult to achieve absent the crisis.

The California legislature authorized an outside agency, the Governor's Office of the Special Hospital Negotiator (GOSH), to negotiate contracts with hospitals for providing inpatient services to Medicaid (more commonly known as Medi-Cal) beneficiaries. GOSH successfully completed its activities before it was phased out after one year of existence (as mandated by the enabling legislation). These contract negotiation responsibilities were then transferred to the California Medical Assistance Commission (CMAC). A single state agency, the Department of Health Services (DHS), maintains responsibility for reviewing all contract selections recommended by GOSH and CMAC, signing all contracts awarded, and monitoring contract performance.

Selective contracting could have been implemented under a number of different scenarios. GOSH chose a combination of elements that simplified administration and expedited the negotiations. First, GOSH chose to use the contract bidding mechanism to lower the rates of hospitals already serving Medi-Cal beneficiaries rather than seeking to channel beneficiaries away from the Medi-Cal providers with higher costs. Second, the state opted to negotiate bids based on an all inclusive per diem rate. Alternatives--such as

¹The severity of the crisis might well have pushed California to seek a waiver under pre-OBRA regulations. The fact that many states confronted such crises coincident with OBRA is a confounding cause in evaluating OBRA's effects, although the availability of OBRA clearly facilitated what was necessary in any event.

Medicare's DRG-based, per admission rates--were considered too administratively complex given that hospitals had previously been paid on a per diem basis. Further, the state was relying on its well established utilization review system to minimize hospital incentives under a per diem to increase a patient's length of stay.

Hospitals which chose to get out of the Medi-Cal business and hospitals which did not meet the state's terms (price) were excluded from participating in the Medi-Cal program.² Not all regions of the state were subject to contracting. Most rural areas and areas in which there was not a sufficient number of hospitals to compete were excluded from the selective contracting program. These hospitals continue to treat Medi-Cal recipients and are reimbursed on a retrospective cost basis with limits.

By all accounts, one crucial event convinced hospitals that the state would reject non-competitive bids: in the first area to be negotiated (San Francisco), the state initially rejected bids from the three largest hospitals, which together historically served 40 percent of the Medi-Cal recipients in San Francisco. Exclusion of these hospitals sent a message to hospitals in the rest of the state that the state did not so highly value participation (and access for recipients) that it would accept bids that were not competitively priced. The state clearly had chosen to exercise much of the market power it had, and the hospitals now understood that fact. In the days following the San Francisco outcome, the state was flooded with phone calls from hospitals in other areas reducing their bids. The San Francisco area bidding

²Hospitals not awarded contracts are reimbursed for emergency cases only.

process was reopened, and--this time--the three excluded hospitals submitted acceptable rates.

During the first year of negotiations, 245 hospitals successfully negotiated Medi-Cal contracts with the state. These hospitals accounted for approximately 87 percent of Medi-Cal inpatient expenditures prior to contracting. Since then, 22 more hospitals have negotiated Medi-Cal contracts, totaling 267 hospitals under selective contracting, accounting for 92 percent of historical Medi-Cal expenditures.³ Most of these additional contracts resulted when the state opened negotiations in five areas previously excluded from contracting. However, several of these additional contracts include non-contract hospitals seeking a contract, as well as five children's hospitals which previously were exempted from selecting contracting.

Prior to selective contracting, hospitals were accustomed to 10-15 percent annual cost-of-living increases from Medi-Cal. Since contracting began, CMAC has successfully maintained a "no-net increase" policy for aggregate hospital contract expenditures. Thus, for three and a half years, if one hospital successfully renegotiated an increase in their contract per diem, CMAC targeted another hospital to renegotiate a lower rate. The state has been able to maintain this unyielding position in part because of the importance of Medi-Cal volume to the contracting hospitals. Low occupancy rates in the state's hospitals have given Medi-Cal more market power than it might otherwise have had, and state officials have chosen to exercise much of that power.

³California Medical Assistance Commission Annual Reports, 1984, 1985, 1986.

Selecting contracting was not designed in 1982 to be a long-term solution to containing Medi-Cal hospital expenditures. The long-term solution (expected at that time to be in place by the late 1980s) was some form of capitated Medicaid payment system. However, there are no signs that contracting will be replaced or is falling apart. Testament to this is the fact that only eight percent of the contract hospitals have terminated their contract with Medi-Cal since the inception of contracting, despite the "no-net-increase" policy. Hospitals appear to consider participation in the Medi-Cal contracting program as a way to cover their marginal costs of treating Medi-Cal patients and are therefore reluctant to forego the marginal revenue that a contract provides.

2.1.2 Implementation in Illinois

The decision to implement selective contracting in Illinois also grew out of a fiscal crisis in the early 1980's. Illinois initially attempted to deal with the crisis through a series of revisions in its retrospective reimbursement policies. Continuing budget problems, dissatisfaction with retrospective reimbursement, the passage of OBRA, and the example set by California finally induced the more drastic shift to selective contracting.

Illinois patterned ICARE after California's selective contracting program, but tailored it to meet Illinois' needs. The major features of the two programs are set forth in Table 2.1. Two important features are similar between the two contracting programs:

- Both states opted to reimburse based on per diems, their historical unit of reimbursement. In both states, the kind of case mix controls necessary to reimburse per admission or discharge (such as DRGs) were considered too time consuming to implement.
- The process of negotiations in both states was similar. The contracting authority completed negotiations by

Table 2.1

Selective Contracting in California and Illinois

	California (effective Feb. 1983)	Illinois (effective June 1985)
Unit of Reimbursement	Per diem - all-inclusive rate, or - separate acute and specialty care rates	Per diem - all-inclusive rate, or - separate acute and specialty care rates
Volume	No volume cap--relied on utilization review	Negotiated volume cap
Payers Covered	Medicaid	Medicaid
Eligible Hospitals	General acute care hospitals in the State	General acute care hospitals in- and out-of-State
Goals	Reduce Medicaid expenditures	- Reduce Medicaid expenditures - Shift care from high-cost to low-cost hospitals
Administrative Authority	- DHS: Administration and Monitoring - CMAC: Negotiating Contracts	OHS: Administration, Monitoring, and Negotiating Contracts
Negotiators	CMAC hired full-time staff with health services background. First-year Cost: \$1.2 million.	OHS hired professional negotiators as consultants.
Contracting Areas:	HFPAs in which a sufficient number of hospitals existed to compete.	HFPAs in which a sufficient number of hospitals existed to compete.
Award Criteria	- Access - Adequate availability of routine and specialty care - Variations in casemix - Utilization controls	- Access - Adequate availability of routine and specialty care - Variations in casemix - Disproportionate share hospitals - Teaching costs considered a pass-through
Contract Period	Indefinite	2 years
Confidentiality of Negotiated Rates	Negotiations and rates confidential	Negotiations confidential, final rates public
Legal Challenges	One lawsuit from hospital wanting contract	None

DHS: Department of Health Services
 CMAC: California Medical Assistance Commission
 OHS: Office of Hospital Services
 HFPAs: Health Facility Planning Areas

regions (Health Facility Planning Areas). Rural areas with few providers or Medicaid recipients were not subject to contracting and continued to obtain Medicaid reimbursement through various retrospective methods.

However, several key features of the California model were adapted by Illinois:

- Illinois intentionally sought to channel patients to lower cost institutions, California did not.
- California chose to use its long-standing utilization review capability to control volume and utilization. Illinois opted for an overall volume cap combined with a modest utilization review program.
- Information available to bidders following the procurement differed. California's process is more confidential--the contracted rates are not public information as in Illinois.
- The contracts are for an indefinite term in California, for two years in Illinois.
- The administration and negotiation functions were split between two agencies in California and concentrated in one agency in Illinois.
- To accommodate the fact that some residents of Illinois seek care in bordering states, Illinois included out-of-state general acute care hospitals in its contracting program. Only in-state general acute care hospitals were eligible for contracting in California.

Perhaps the most important dimension along which the two programs differed is the way the states structured the reimbursement levels that were to be negotiated. California sought bids for price, uncoupled from any volume constraint (except as the hospital sought to limit its Medi-Cal population). Illinois, by contrast, considered price and volume terms together in the negotiations, deliberately negotiating smaller volume caps (relative to historical volumes) for higher-priced hospitals (typically teaching and specialty facilities) and larger volume caps with community hospitals charging lower prices.

One puzzling difference between the California and Illinois approaches to selective contracting is the degree to which they released information about the rates that were negotiated with the hospitals. In California, the Medi-Cal hospital rates are a closely guarded secret, while in Illinois they are public information. From a theoretical perspective, it is unlikely that public disclosure of rates would disadvantage a state in future rounds of negotiation. This observation is based on the finding that oral auctions and sealed bid auctions can yield the same average results to the bid-taker under many circumstances.⁴

While Illinois had experienced only one year under ICARE at the time of the case study, preliminary evidence suggests that the program was successful in accomplishing its goals. The average daily rate for inpatient care under ICARE was about 6.5 percent less in real terms than the previous rate. The state estimated that they would spend 6 percent less in fiscal year 1986 than in fiscal year 1985 for about the same number of days historically provided. Further, inpatient care was shifted from high- to low-cost hospitals. Teaching and specialty hospitals received about a 13 and 7 percent

⁴At an oral auction, bidders learn from the flow of bids if their own initial plans for bidding were too high or too low relative to their competitors. This results in some bidders raising their intended price and others lowering theirs. On average, the winning bid in an oral auction -- where everyone knows who has been actively bidding and how much they have offered -- often turns out to be close to what would have come out of a sealed bid auction simply because mistakes toward overly high or overly low prices tend to cancel out each other. If we apply this theoretical observation to hospital selective contracting, it seems likely that disclosure of bids would result in some narrowing of the variance in bids in future rounds of contracting. However, mean prices are not likely to be affected because public disclosure of bids will encourage some hospitals to bid lower next time ("we almost lost") just as it will encourage others to bid higher ("we bid too low") (Engelbrecht-Wiggans, R., 1980).

decrease in days, respectively, while community hospitals received about an 11 percent increase in days.

However, several issues arose during the first year under ICARE which led the state to negotiate more days and to amend the contracts. Due to a combination of factors, such as hospitals not managing their days well and patients continuing to present themselves to hospitals that were close to their volume cap, several hospitals ran out of Medicaid reimbursable days before the end of the fiscal year. To address this problem, the state negotiated an additional 15,000 days of care. In addition, hospital concerns about the open-ended nature of the contracts and the transfer policies under ICARE led the state to include a renegotiation clause in the contracts and to establish provisions for post-emergency care when hospitals exhausted the number of days in their contracts. Whether such problems can continue to be resolved in a way that permits continued savings--and what impacts the system has on other payers and on recipients--are questions that can only be answered as the system matures.

2.2 Impacts of Selective Contracting in California

Given the unexpected longevity of selective contracting in California, the recent adoption of selective contracting by Illinois, and its consideration by other states, it is important to determine the impacts of such a program. Specifically, what have been the impacts on Medi-Cal recipients and on the Medi-Cal budget? It is difficult, however, to answer these questions directly. Medi-Cal selective contracting was one of many changes in California hospital financing that took place during the same period that Medi-Cal selective contracting was adopted and implemented:

- The definition of Medi-Cal 'medical necessity' was narrowed, which effectively denied coverage for many elective services which were formerly provided.
- The Medically Indigent Adult (MIA) eligibility category was eliminated from the Medi-Cal program and transferred to county government responsibility.
- Non-government payers were legislatively granted the same hospital contracting privileges as the state, paving the way for establishing Preferred Provider Organizations (PPOs) to negotiate special reimbursement arrangements (and to reduce, to the extent of their growth, hospital opportunities for cost shifting).

In addition to these changes at the state level, a variety of federal policies focusing on hospital cost containment also changed the fiscal environment for hospitals and the state. For example, the Tax Equity and Fiscal Responsibility Act (TEFRA) of 1982 limited the level and rate of increase of allowable Medicare hospital operating costs. Similarly, Medicare's Prospective Payment System using DRGs was phased in during the same period as Medi-Cal selective contracting. Thus, it is difficult to completely isolate the impacts of Medi-Cal selective contracting on recipients and expenditures from these other forces at the state and federal levels.

2.2.1 Previous Research

Most studies, to date, have been qualitative in nature, reporting on the adoption and implementation process of selective contracting in California. Early reports typically described the characteristics of the system (Inglehart, 1984) and debated whether selective contracting was competition or simply more regulation. While there can be no definitive answer, some heralded selective contracting as an introduction of competition in the health care marketplace (Melia, 1983; Kinzer, 1983; Johns et al., 1983) while others perceived Medi-Cal selective contracting as more regulation (Petersdorf,

1983), or as one evaluation depicted it, "negotiated rate-setting" (Koetting and Olinger, 1984).

Later research efforts focussed on the outcomes of the contract negotiations (Koetting and Olinger, 1984; Johns et al., 1984; Brown, 1985), describing which hospitals were and were not awarded contracts. These studies also reported on the initial impacts on the health care marketplace, relying on interviews with several hospital administrators, state officials, representatives from insurance companies and patient advocacy groups, as well as identifying initial trends in utilization and expenditures. In general, these studies concur that hospital dependence on Medi-Cal inpatient revenues and the presence of teaching programs were important factors in winning contracts, resulting in the award of contracts to all University of California hospitals and all county hospitals. The interviews conducted as part of these studies generally revealed no indication that hospitals were increasing the patients' hospital stay, nor that beneficiary access to services or freedom of choice of provider had been impaired. One study (Koetting and Olinger, 1984) analyzed month-of-service hospital claims, examining the initial rate reduction resulting from the contract negotiations. The rates for inpatient services were estimated to be about 13 percent lower than they would have been without Medi-Cal selective contracting. By far, the greatest savings were extracted from state teaching hospitals. County hospitals, on the other hand, experienced lower than average rate reductions. Further analysis of this issue in this report (see below) shows that hospitals with historically high Medi-Cal volumes were more likely to be winners of Medi-Cal contracts; many other characteristics of hospitals (e.g., teaching status, county affiliation) had no statistically significant effect on the probability of winning a contract.

More recent studies have undertaken original data analysis, as data becomes available. One internal study found that, statewide, overall utilization has declined between 1981 and 1984, but that this decline existed prior to the implementation of selective contracting and was due to the cost containment efforts by the various payers (OSHPD, 1986). This same study examined the impacts of competition among all payers on the quality of care, as measured by the structural measure of change in the number of registered nursing hours per patient day. According to this study (which does not isolate treatment for Medi-Cal patients), there is no evidence that quality of care has deteriorated, as nursing care in acute hospitals did not significantly decline in the first years of competition.

Other studies have examined Medi-Cal data specifically and found a similar decline in utilization among the Medi-Cal population (CHFC, 1985; Johns et al., 1985). However, one of these studies also cited a slight increase in the average Medi-Cal length of stay (Johns et al., 1985). Medi-Cal revenues per patient day were also found to have declined after contract implementation (CHFC, 1985). No study, to date, has isolated the impacts of selective contracting on the quality of care received by Medi-Cal patients.

This paper continues the research on the impacts of Medi-Cal selective contracting on beneficiaries and expenditures. Specifically, five questions are examined:

- Have the characteristics of Medi-Cal patients admitted to the hospital changed after contract implementation?
- Has hospital utilization changed after contract implementation?
- What has been the effect of selective contracting on the quality of care received by Medi-Cal patients?

- Have Medi-Cal expenditures declined after contract implementation, and what is the estimated level of first year savings?
- What has been the financial impact on hospitals?

2.2.2 Methods and Data Sources

To address the above questions, a sample of Medi-Cal hospital inpatient and outpatient patient claims were analyzed. A one-week sample of hospital admissions and outpatient visits before hospital contracting were compared to admissions and visits during the same week after contract implementation.⁵ The sample consisted of a total of 12,611 admissions and 76,613 outpatient visits during the two one-week time periods. Claims were limited to hospitals that were eligible for contracting. Certain specialty, children's and federal hospitals were exempt from contracting as well as hospitals in areas where contracting was not in effect.⁶

The claim sample examined has several strengths. First, the sample is large enough to detect statistically significant differences between the pre-contracting and post-contracting periods. Second, the sampling periods allow us to compare periods that are likely to be free of transitory disturbances. The pre-contract week occurs one month before the start of the selective contracting process while the post-contracting period week occurs almost one year after contract implementation. Third, by comparing the same weeks, our data are free of any seasonal fluctuation in utilization.

⁵The sample is based on Medi-Cal patient claims with dates of service from January 21-27 in 1983 and 1984. Claims from MIA recipients are excluded. The pre-period is based on the week in 1983 and the post-period is represented by the week in 1984.

⁶Children's hospitals became eligible for contracting as of November 1, 1984, after a study identified that this extension of the system was feasible and potentially cost effective.

In all, a total of 335 hospitals were eligible to receive contracts.⁷ Over three quarters (245) of these hospitals negotiated a contract with the state. The remaining ninety hospitals became "non-contract" hospitals providing Medi-Cal services only in emergency situations.

A number of hospitals are not present in the sample of patient claims simply because they had no claims during the sample week. Table 2.2 compares the number of hospitals present in both the 1983 and 1984 samples to the total number of eligible hospitals.⁸ Overall, about 79 percent of the hospitals eligible for contracting submitted claims during the sample period. However, the hospitals that did not submit claims represent less than 4 percent of the Medi-Cal volume in the twelve months prior to contract implementation. For the most part, the hospitals that did not submit claims in the sample period are hospitals that typically did not treat a large volume of Medi-Cal patients, and did not treat any Medi-Cal patients in the sample week after contract implementation. For example, 91 percent of the contract hospitals submitted claims in the sample period; these hospitals account for almost 99 percent of the annual volume of Medi-Cal patients treated at contract hospitals. In addition, slightly less than half of the non-contract hospitals submitted claims in the sample period; these accounted for 77 percent of the Medi-Cal days in non-contract hospitals prior to contracting. In general, the

⁷The number of eligible hospitals and non-contracting hospitals may differ slightly from the number of hospitals reported by CMAC because CMAC includes Kaiser, federal and other types of hospitals in its figures. Also, the numbers will be affected by whether multi-hospital systems submit joint or separate claims.

⁸There are 29 hospitals, the majority (24) of which are non-contract hospitals, that are in the 1983 sample, but not in the 1984 sample. These hospitals provided less than 4000 Medi-Cal days each in the 12 months prior to contracting and were typically investor-owned non-teaching hospitals. Analyses at the hospital level were limited to paired observations; however, analyses at the patient level were based on all observations.

Table 2.2

Comparison of Eligible Hospitals
to Hospitals Submitting Claims During the Sample Period

	<u>Number of Hospitals</u>	<u>Annual Volume^a</u> (days)
<u>Contract Hospitals</u>		
Eligible Hospitals	245	1,503,292
Hospitals with Claims	223 (91.02%)	1,487,699 (98.96%)
Hospitals without Claims	22 (8.98%)	15,593 (1.04%)
<u>Non-Contract Hospitals</u>		
Eligible Hospitals	90	192,585
Hospitals with Claims	43 (47.78%)	147,850 (76.77%)
Hospitals without Claims	47 (52.22%)	44,735 (23.23%)
<u>All Hospitals</u>		
Eligible Hospitals	335	1,695,877
Hospitals with Claims	266 (79.4%)	1,635,549 (96.44%)
Hospitals without Claims	69 (20.6%)	60,328 (3.56%)

^aThe volume of days represents the 12 months prior to the effective date of contracting.

hospitals for which no claims were found in the sample period tend to be investor-owned hospitals. About half are small urban hospitals. Thus, analyses at the hospital level represent non-contract hospitals and investor-owned hospitals in proportion to their actual volume of Medi-Cal claims.

2.2.3 Characteristics of Admitted Patients

The characteristics of the patients admitted to these hospitals are typical of most Medicaid patients nationwide. Table 2.3 displays the characteristics of patients admitted to hospitals before and after contracting based upon our sample of claims. Since AFDC recipients are the largest group eligible for Medicaid services, slightly more than two-thirds of the patients were women. About 60 percent of the patients were between 19 and 64 years old. Few elderly patients are represented. About 14 percent of the claims submitted after contracting were for the delivery of newborns, about a 3 percent decrease than before contracting. In addition, about 16 percent of the claims after contracting were for the dependent children of Medi-Cal recipients, representing about a 2 percent increase compared to the sample of claims submitted before contracting.

The percentage of patients undergoing surgical procedures did not change in the contract hospitals but it decreased significantly in the non-contract hospitals. Surgery might be expected to change if hospitals respond to the incentive to reduce procedures within the limits of discretion. Prior to contracting about 42 percent of the patients underwent surgery. After contract implementation, the same percentage of patients treated in contract hospitals also had surgery. However, the percent of patients undergoing surgery in non-contract hospitals decreased significantly by 26 percentage points--from 42 percent to 16 percent. Presumably, these surgical cases

Table 2.3

Patient Characteristics^a
(admissions)

	<u>Contract Hospitals</u>			<u>Non-Contract Hospitals</u>			<u>All Hospitals</u>		
	<u>Pre</u> (5542)	<u>Post</u> (6315)	<u>Difference</u>	<u>Pre</u> (631)	<u>Post</u> (123)	<u>Difference</u>	<u>Pre</u> (6173)	<u>Post</u> (6438)	<u>Difference</u>
<u>Sex</u>									
Male	30.8%	29.9%	-0.9	25.8%	31.7%	+5.9	30.3%	29.9%	-0.4
Female	69.2%	70.1%	+0.9	74.2%	68.3%	-5.9	69.7%	70.1%	+0.4
<u>Age</u>									
Newborn	18.2%	14.4%	-3.8***	8.9%	5.7%	-3.2	17.3%	14.2%	-3.1***
1-18yrs	14.8%	16.2%	+1.4**	14.1%	6.5%	-7.6**	14.7%	16.0%	+1.3**
19-30yrs	31.4%	32.0%	+0.6	29.5%	13.0%	-16.5***	31.2%	31.6%	+0.4
31-64yrs	28.2%	29.7%	+1.5*	35.2%	33.3%	-1.9	29.0%	29.8%	+0.8
65+	7.4%	7.7%	+0.3	12.4%	41.5%	+29.1***	7.9%	8.4%	+0.5
<u>Surgery</u>									
	42.8%	43.3%	+0.5	41.5%	15.5%	-26.0***	42.7%	42.8%	+0.1

***Differences between time periods are significant at the .01 level.

**Differences between time periods are significant at the .05 level.

*Differences between time periods are significant at the .10 level.

^aThe analysis is based on a sample of Medi-Cal inpatient and outpatient hospital claims for a one week period in January of 1983 (pre-period) and 1984 (post-period). The sample includes only hospitals that were eligible for contracting during the first year of contracting and thus excludes hospitals in areas where contracting is not in effect and certain specialty, Children's and federal hospitals.

performed in non-contract hospitals were conducted on emergency cases.

The illnesses for which patients were admitted can also be expected to change, given that patients were shifted from non-contract to contract hospitals. Patient diagnoses were aggregated into 18 Major Diagnostic Categories (MDCs), as shown in Table 2.4. By far, the majority of admissions were related to pregnancy and childbirth. Slightly more than a quarter of the admissions in contract hospitals were for this reason. Other frequently treated diagnoses in contract hospitals included miscellaneous contact with the health system, respiratory illnesses, and injury and poisoning. Changes in the percentage of patients admitted for particular diagnoses occurred before and after contracting for several diagnostic categories. Contract hospitals experienced a 2 percent increase in the proportion of patients admitted for pregnancy and childbirth, and for respiratory illnesses (such as asthma or pneumonia) which are common diagnoses/illnesses among Medi-Cal beneficiaries. There was a significant decrease for admissions related to miscellaneous contact with the health system.

The diagnoses for which patients were admitted to non-contract hospitals after contract implementation also changed as a result of the shift in hospital use. Not surprisingly, the proportion of admissions associated with non-discretionary or emergency illnesses increased. For example, non-contract hospitals experienced an 11 percentage point increase in the proportion of admissions related to circulatory problems (e.g., heart failure) and mental illness. In contrast, there was a significant decrease in the percentage of admissions for pregnancy and childbirth in non-contract hospitals from 23 percent of admissions prior to contracting to about 5 percent after contracting. The latter admissions for childbirth were most likely emergency deliveries.

Table 2.4

Percent of Admissions by
Major Diagnostic Category (MDC)^a
(admissions)

MDC	1983 Cost Per Admission	Contract Hospitals		Non Contract Hospitals		All Hospitals	
		Pre (5542)	Post (6315)	Pre (631)	Post (123)	Pre (6173)	Post (6438)
1. Infectious Parasitic Diseases	\$4317	1.73	1.87	1.11	0.81	1.67	1.85
2. Neoplasms	\$4966	3.84	4.01	5.71	3.25	4.03	4.00
3. Endocrine, Nutritional Metabolic	\$3359	2.69	2.41	3.49	0.81	2.77	2.38
4. Diseases of the Blood	\$2587	1.10	0.62***	0.63	0.00	1.05	0.61***
5. Mental Disorders	\$2814	2.44	2.80	5.55	21.95***	2.75	3.17
6. Diseases of the Nervous System and Sense Organ	\$3118	3.12	2.47**	2.38	2.44	3.05	2.47***
7. Diseases of the Circulatory System	\$5869	6.86	7.47	10.30	21.14***	7.21	7.74
8. Diseases of the Respiratory System	\$3208	10.57	13.10***	9.83	9.76	10.50	13.03***
9. Diseases of the Digestive System	\$4167	7.11	7.28	7.61	8.13	7.16	7.30
10. Diseases of the Genitourinary System	\$3105	4.73	4.21	5.71	3.25	4.83	4.19+
11. Diseases of Pregnancy, Childbirth Puerperium Conditions	\$1746	26.96	29.06***	22.9	4.88***	26.55	28.60***
12. Diseases of the Skin	\$3739	1.16	1.58**	1.11	1.63	1.15	1.58***
13. Diseases of the Muscles/ Connective Tissue	\$3543	2.40	2.19	3.49	0.81	2.51	2.16
14. Congenital Anomalies	\$6968	0.88	0.55**	0.32	0.81	0.83	0.56+
15. Perinatal Conditions	\$5798	1.57	1.31	0.95	0.81	1.51	1.31
16. Ill-defined Conditions	\$3206	4.84	4.93	7.13	7.32	5.07	4.97
17. Injury/Poisoning	\$3927	6.39	6.52	5.86	9.76	6.33	6.59
18. Contact w/Health System	\$1645	11.60	7.62***	5.71	2.44	11.00	7.52***
19. External Causes of Injury and Poisoning	\$1070	0.02	0.00	0.16	0.00	0.03	0.00
Average Weighted Cost (in 1983 dollars)		\$3084	\$3124	\$3307	\$3847	\$3106	\$3138
Case Mix Index		1.00	1.01	1.00	1.16	1.00	1.01

***Differences between time periods are significant at the .01 level.

**Differences between time periods are significant at the .05 level.

*Differences between time periods are significant at the .01 level.

^aThe analysis is based on a sample of Medi-Cal inpatient hospital claims for a one week period in January of 1983 (pre-period) and 1984 (post-period). The sample includes only hospitals that were eligible for contracting during the first year of contracting and thus excludes hospitals in areas where contracting is not in effect and certain specialty, Children's and federal hospitals.

Did these changes in the distribution of diagnoses result in a more severe casemix? To examine this issue, we constructed a casemix index where the proportion of cases in each MDC were weighted by the average statewide cost per admission in 1983 in that MDC.⁹ The index thus measures the relative costliness of cases treated in the post period compared to the relative costliness of cases treated in the pre-contract period.

The index shows that there was relatively little change in casemix severity. As Table 2.4 indicates, over all hospitals, the weighted average cost per admission was 32 dollars more than the estimate for the post period when all admissions are valued at 1983 average costs. This represents a 1 percent increase in casemix. Non-contract hospitals experienced a substantial increase in case mix severity (on, of course, a much smaller caseload). The weighted average cost per admission in these hospitals prior to contracting was 3,307 dollars, whereas the estimate for the average cost per admission after contract implementation, controlling for costs, was 3,847 dollars, representing a 16 percent increase in casemix severity. Since non-contract hospitals treat only emergency cases under contracting, this change in casemix is not surprising.

⁹The index is defined as:

$$I = \frac{\sum C_{i83} n_{ij83}}{\sum C_{i83} n_{ij84}}$$

where

- C_{i83} = The statewide average cost per admission in the i th MDC in 1983.
- n_{ij83} = The number of cases in the i th MDC treated in the j th hospital in 1983.
- n_{ij84} = The number of cases in the i th MDC treated in the j th hospital in 1984.

2.2.4 Utilization Changes

California's selective contracting program could be expected to change hospital utilization in several ways. First, hospitals awarded contracts must absorb the patients that previously were admitted to non-contract hospitals. Thus, admissions can be expected to increase in contract hospitals and decrease in non-contract hospitals. Statewide, there is no reason to expect that the total number of patients admitted to hospitals would significantly change under selective contracting, but individual contract hospitals would have to absorb significant new volumes. Second, even though outpatient services were not subject to selective contracting, the utilization of outpatient care might also change as a result of changes in access to hospitals.

Table 2.5 shows the change in utilization before and after contract implementation. Over all hospitals, a five percent increase in admissions and a four percent increase in days occurred. As expected, the total number of admissions and days in contract hospitals increased by almost 13 percent and 11 percent respectively, absorbing the patients that previously were treated in non-contract hospitals. The number of patients admitted to non-contract hospitals (and consequently their total number of hospital days) decreased substantially during the sample period, from about 500 admissions and 2,632 days before contracting to about 100 admissions and 882 days after contracting, a 78 percent and 67 percent reduction respectively.

The incentive of paying on a per diem, combined with a reduction in the negotiated rate per day, could encourage hospitals to increase the length of the patient's hospital stay. However, there is no evidence that hospitals responded in this manner. As Table 2.5 shows, there was virtually no difference in the length of stay in contract hospitals, or across all the

Table 2.5

Medi-Cal Utilization Changes
Before and After Selective Contracting^{a, b}

	Contract Hospitals (223)			Non-Contract Hospitals (42)			All Hospitals (265)		
	Pre	Post	Percent Change	Pre	Post	Percent Change	Pre	Post	Percent Change
Inpatient Services:									
Number of Inpatient Admissions	5,306	5,971	+12.5%	499	112	-77.6%	5,805	6,083	+4.8%
Days	27,703	30,702	+10.8%	2632	882	-66.5%	30,335	31,584	+4.1
Average Length of Stay ^c	5.3	5.1	-3.8***	5.5	8.1	+47.3%***	5.3	5.2	-1.9%***

***Differences for means between the pre- and post- periods are significant at the .01 level.

^aThe analysis is based on a sample of Medi-Cal inpatient and outpatient hospital claims for a one week period in January of 1983 (pre-period) and 1984 (post-period). The sample includes only hospitals that were eligible for contracting during the first year of contracting and thus excludes hospitals in areas where contracting is not in effect and certain specialty, Children's and federal hospitals.

^bThe number of hospitals includes only those hospitals in both the 1983 and 1984 samples.

^cThe means are weighted by the number of admissions.

hospitals between the two time periods.¹⁰ Overall, the average length of stay decreased slightly from 5.3 days in 1983 to 5.2 days in 1984. The average length of stay in contract hospitals decreased from 5.3 days to 5.1 days.¹¹ In contrast, the average length of stay in non-contract hospitals increased substantially, from 5.5 days in 1983 to 8.1 days in 1984, close to a fifty percent increase. This significant increase in the length of stay apparently represents the emergency cases admitted by non-contract hospitals which must be stabilized before being transferred to a contract hospital. As a result, these patients are likely to remain hospitalized for a longer time than patients admitted for non-emergency situations. The increase in the proportion of psychiatric cases in non-contract hospitals also explains the increase in LOS. These cases are usually difficult to transfer and the non-contract hospitals may have been under little pressure to hasten such transfers.

As we have noted earlier, selective contracting was expected to lower the per diem rates which would be paid to hospitals; however, hospitals should not have bid rates which were below their (marginal) cost unless they made an error in calculation or they were engaged in some strategic attempt to capture market share.

How hospitals may be expected to respond to the new reimbursement rates generated by selective contracting depends upon several factors: 1) how

¹⁰Multivariate analysis was also applied to live discharges to confirm the absence of a change in the average length of stay. Differences in hospital characteristics (peer group, ownership, bed size, occupancy rate, dependency on Medi-Cal revenues) and patient characteristics (diagnoses, age, sex, discharge status, and whether the patient had undergone surgery) were controlled. The actual and estimated average length of stay in 1984 were identical, 5.1 days.

¹¹While the differences are significantly different between time periods, the percentage decrease represents less than half a hospital day.

hospital costs vary with the length of stay, 2) how effective the state's utilization review program is at identifying and correcting inappropriately long stays, and 3) whether or not the hospital's reimbursement rate under selective contracting is "profitable", i.e., higher than marginal costs. Combinations of these three factors lead to different predictions of possible behavior. Let us assume that utilization review is effective at constraining length of stay within a narrow range. (If UR is ineffective and costs fall with length of stay, a hospital will face an incentive to have very long lengths of stay.) If a hospital has a profitable rate, it will be willing to admit a case and it will always have an incentive to make length of stay as long as possible. If a hospital does not have a profitable rate, it will try to avoid an admission or, if an admission cannot be avoided, it will try to make the stay as short as possible. The only exception would be the case where costs fall with the length of stay so that eventually a case may become profitable (if UR allows the patient to stay long enough).

To examine the actual relationship between changes in reimbursement and length of stay, we correlated the change in a hospital's average length of stay (CLOS) with the relative reimbursement change in Medi-Cal payments before vs. after the start of contracting. Relative Reimbursement Change (RRC) is defined here as the product of the percent of total revenues which the hospital received from Medi-Cal times the percentage change in the hospital per diem. Thus, if 10 percent of a hospital's revenue came from Medi-Cal and the hospital received a 5 percent reduction in its rate, the value for the hospital would be $-.005$.

Table 2.6 reports the distributions of RRC and CLOS. As shown in the table, there is a mild positive correlation ($.129$) between the two variables for the 220 hospitals on which we have data; this correlation becomes slightly

Table 2.6

Relative Revenue Change (RCC) Compared to
Change in Average Length of Stay (CLOS) for Contract Hospitals^{a,b}

Relative Revenue Change (RRC)	Average Length of Stay (admissions)		Change in the Average Length of Stay (CLOS)		
	Pre	Post	less than 1 day		1 day or more increase
			1 day or more decrease	increase/or decrease	
					(number of hospitals)
Negative -.13 to -.02	5.5 (2132)	5.2 (2182)	23	23	21
Breakeven -.021 to .099	5.5 (1914)	5.3 (2256)	33	39	40
Positive .10 to .35	4.3 (1213)	4.7 (1463)	5	18	18

Correlation RRC to CLOS

All Hospitals
(N=220) .129*

Hospitals with Change in
RRC of + 1 percent or more
(N=144) .159**

*Significant at 90 percent level of confidence.

**Significant at 95 percent level of confidence.

^aThe analysis is based on a sample of Medi-Cal inpatient hospital claims for a one week period in January of 1983 (pre-period) and 1984 (post-period). The sample includes only hospitals that were eligible for contracting during the first year of contracting and thus excludes hospitals in areas where contracting is not in effect and certain specialty, Children's and federal hospitals. All dollars represent constant dollars as of January 1983.

^bThe number of hospitals includes only those hospitals in both the 1983 and 1984 samples.

^cRevenue impact is a function of the level of dependency on Medi-Cal revenues and the percent change in the negotiated per diem.

stronger (.159) when only the 144 hospitals which experienced changes in RRC of one percent or more ($-.009 < \text{RRC} < +.009$) are considered.

This finding suggests that hospitals which experienced improvements in their Medi-Cal reimbursement tended to increase their length of stay, while hospitals experiencing decreases in reimbursement tried to decrease their lengths of stay. By implication, it also suggests that hospital costs tend to fall with longer lengths of stay (assuming, of course, that utilization review does not restrict length of stay so tightly as to deny hospitals any discretion). But these effects are weak, in any event.

Outpatient Substitution

Since outpatient services were not covered by the selective contracting program, indirect impacts on outpatient care could have occurred. Indeed, as Table 2.7 shows, the number of outpatient visits in contract hospitals increased substantially, by 15 percent.¹² Interviews with hospital staff indicated that many non-contract hospitals were concerned about the continuity of care. As a result, these hospitals often encouraged Medi-Cal patients (largely emergency cases) to seek post-treatment outpatient care at contract hospitals. At the same time, the state also indicated that Medi-Cal recipients were slightly confused by the limit on their freedom of choice, assuming that they could be treated only at contract hospitals for both inpatient and outpatient care. While these explanations can account for the substantial shift in the location of providing outpatient care, it also appears that the total number of outpatient visits increased across all hospitals, perhaps because contract hospitals were responding to decreases in

¹²While not shown in Table 2.7, the number of outpatient visits decreased substantially, by 17 percent, in non-contract hospitals. Over all hospitals (contract and non-contract), the number of outpatient visits increased by almost 13 percent.

Table 2.7

Total Number of Outpatient
Visits and Ratio of Inpatient
Admissions to Outpatient Visits
Among Contract Hospitals^{a,b}

	<u>Pre</u>	<u>Post</u>	<u>Percent Change</u>
Outpatient Visits	32,063	36,884	+15.0%
<u>Ratio of Admissions to Visits:</u>			
Over All Diagnoses	.219	.218	-0.5%
Pneumonia	1.00	1.22	+22.0%*
Asthma	.73	.69	-5.5%

*Differences are significant between time periods at the .10 level.

^aThe analysis is based on a sample of Medi-Cal inpatient and outpatient hospital claims for a one week period in January of 1983 (pre-period) and 1984 (post-period). The sample includes only hospitals that were eligible for contracting during the first year of contracting and thus excludes hospitals in areas where contracting is not in effect and certain specialty, Children's and federal hospitals.

^bThe number of hospitals includes only those hospitals in both the 1983 and 1984 samples.

their reimbursement rates. These lower rates may have encouraged contract hospitals to avoid unprofitable admissions and favor outpatient care as a substitute.

To investigate whether such substitution occurred, the ratio of the number of admissions to the number of outpatient visits was calculated across all diagnoses and for several diagnoses that were identified to be potential candidates for such substitution. Due to the available sample size, results are only reported for all diagnoses and for diagnoses of asthma and pneumonia. Table 2.7 shows these ratios.

In general, there is no substantial evidence that any substitution of outpatient services for inpatient services occurred after contract implementation. Across all diagnoses, the ratio of inpatient admissions to outpatient visits was virtually the same before and after contracting--for every 5 outpatient visits, about one patient was admitted to the hospital. However, the ratio of admissions to outpatient visits for pneumonia increased significantly, by 22 percent, indicating a lack of outpatient substitution for this diagnosis. On the other hand, the ratio for asthma did not significantly change between time periods. Examining these ratios by peer group status or by the relative revenue impact did not reveal any evidence that different types of hospitals were behaving any differently. Thus, there is not strong evidence that hospitals are substituting outpatient services for inpatient care.

2.2.5 Quality of Care

Our analysis also considered how the implementation of selective contracting may have affected the quality of care in California hospitals. From a theoretical perspective, selective contracting should have encouraged hospitals to examine their costs, formulate strategies for improved efficien-

cy, and submit bids reflective of discovered economies. As in any auction, hospitals had the options of not bidding at all and of not bidding at prices which would cause a loss to the hospital. Presumably, all bids submitted by the hospitals reflected prices at which the hospital would at least cover its marginal cost. It is of course always possible that some hospitals made errors in bidding. Some may have misjudged their costs and bid too low by mistake; others may have knowingly bid below cost in a financially ill-conceived strategy to capture market share, or to preserve a commitment to community service, etc. Among those who might have submitted loss-incurring bids, there is the danger that too low a level of reimbursement might have restricted the availability of inputs to a point where patient care was seriously compromised. (There was, of course, an incentive for all hospitals to restrict inputs, whether or not the rates covered costs.)

To examine possible impacts upon the quality of care, we examined information on 1) patient disposition, and 2) mortality rates. Patient disposition refers to where patients were situated (back at home, in a nursing home, transferred to another hospital, discharged dead, not yet discharged from hospital) following a hospital admission. Adverse outcomes of selective contracting would probably be indicated by increases in transfers among contracting hospitals (a possible sign that the originating hospital was unable or unwilling to continue to treat the patient), increases in the number of deaths in the hospital, increases in the transfers to nursing homes, and by corresponding decreases in discharges to a person's home. Some of these dispositions, of course, do not necessarily mean a deterioration in care. For example, it may be appropriate to discharge a patient to a nursing home rather than to incur a longer hospital stay. However, such a transfer would indicate a change in the hospital's incentive to retain a patient.

Mortality rates within 30 days of admission were also examined overall and in selected categories which were likely to include high proportions of Medicaid patients (e.g., maternity) and where constrained resources might be expected to have an effect on death rates.

Table 2.8 shows changes in patient disposition before and after selective contracting. Virtually no changes in disposition were found among contract hospitals. In general, the majority (about 92 percent) of patients were routinely discharged to their home in both periods, as shown in the table. About 1.5 percent of Medi-Cal patients died in the hospital, and less than 1 percent of the patients were transferred to another acute care facility or discharged to a long term care facility. About five or six percent of the patients in this sample remained in the hospital for continued treatment. The discharge distribution among contract hospitals was essentially unchanged before and after contracting. There was only one small but statistically significant change among contract hospitals. This was in the percentage of discharges to long term care facilities, which decreased from 0.5 percent to 0.2 percent. We have no reason to believe this small change was due to the contracting program, particularly since there is no evidence that it was accompanied by an increased length of stay in the hospital.

Not surprisingly, the discharge distribution among non-contract hospitals was significantly different between time periods. Routine discharges declined substantially, by 11 percentage points, from 92 percent before contracting to about 81 percent after contracting. At the same time, there was a significant rise in the proportion of patients discharged to long term care facilities and in the proportion transferred to other acute care hospitals. About 1 percent of the patients went to nursing homes prior to contracting. After contracting, the proportion more than doubled, to about 3 percent. Similarly, less than 1 percent of the patients were transferred to

Table 2.8

Medi-Cal Patient Disposition,
Before and After Selective Contracting^a
(admissions)

	Contract Hospitals			Non-Contract Hospitals			All Hospital		
	Pre (5542)	Post (6315)	Difference	Pre (631)	Post (123)	Difference	Pre (6173)	Post (6438)	Difference
Routine Discharge to Home	92.1%	91.9%	-0.2	91.6%	80.5%	-11.1***	92.1%	91.7%	-0.40
Discharged to Long Term Care Facility	0.45%	0.24%	-0.21**	1.1%	3.3%	+2.2**	.52%	.30%	-0.22**
Transferred to Other Term Care Facility	0.52%	0.40%	-0.12	.48%	5.7%	+5.22***	.52%	.50%	-0.02
Still a Patient	5.50%	6.10%	+0.6	4.1%	6.5%	+2.4	5.35	6.2%	+0.85**
Died in Hospital	1.4%	1.3%	-0.1	2.5%	4.1%	+1.6	1.5%	1.4%	-0.10

***Differences for means between the pre- and post- periods are significant at the .01 level.

**Differences for means between the pre- and post- periods are significant at the .05 level.

^aThe analysis is based on a sample of Medi-Cal inpatient hospital claims for a one week period in January of 1983 (pre-period) and 1984 (post-period). The sample includes only hospitals that were eligible for contracting during the first year of contracting and thus excludes hospitals in areas where contracting is not in effect and certain specialty, Children's and federal hospitals.

another hospital prior to contract implementation whereas close to 6 percent were transferred after contract implementation. The latter result is consistent with selective contracting policy which requires patients in non-contract hospitals to be transferred to contract hospitals after stabilization.

Changes in fatality rates can suggest whether Medi-Cal patients have, in general, experienced serious negative impacts on quality of care under selective contracting; these adverse effects might stem from reduced resource consumption, from poorer access, or from the program's transfer policies for emergency admissions to non-contract hospitals. While death rates in the hospital did not significantly change between time periods (see above), a much better measure of patient outcome is the proportion of patients dying after discharge within a fixed period of time post admission. Mortality rates within thirty days of admission are shown in Table 2.9 for contract hospitals and non-contract hospitals before and after contract implementation. Mortality rates for patients with selected diagnoses sensitive to changes in hospital practice patterns and maternity-related diagnoses are also shown.

There is no evidence that Medi-Cal beneficiaries experienced adverse impacts under selective contracting. There were no statistically significant changes (at at least the 90 percent level of confidence) between time periods in the proportion of patients who died within thirty days of admission. About 2 percent of patients across all hospitals died within thirty days of admission in both time periods. The proportion among contract hospitals remained stable at 1.8 percent. While the proportion of patients dying within thirty days of admission increased from about 3 percent to about 6 percent among non-contract hospitals, the difference was not significant, due to the small sample size. However, it is interesting to note that non-contract hospitals generally had higher fatality rates prior to contracting (3.3 percent) than

Table 2.9

Fatality Rates within Admission 30 Days of Admission^a
for California Medi-Cal, 1983-1984
(admissions)

	Contract Hospitals			Non-Contract Hospitals			All Hospitals		
	Pre (5542)	Post (6315)	Difference	Pre (631)	Post (123)	Difference	Pre (6173)	Post (6438)	Difference
<u>Overall</u>	1.82%	1.84%	+0.02	3.32%	5.69%	+2.37	1.98%	1.91%	-.07
<u>Selected Diagnoses:</u>									
Normal Delivery	0	0	-	0.16	0	-.16	0.02	0	-.02
Single Liveborn	0.04	0.02	-.02	0	0	-	0.03	0.02	-.01
Perinatal Conditions	0.02	0.03	+.01	0	0	-	0.02	0.03	+.01
Pneumonia	0.09	0.13	+.04	0.32	0.81	+.49	0.11	0.14	+.03
Heart Failure	0.04	0.05	+.01	0	0.81	+.81	0.03	0.06	+.03
AMI	0.07	0.08	+.01	0.16	0	-.16	0.08	0.08	-

There are no significant differences between time periods.

^aThe analysis is based on a sample of Medi-Cal inpatient and outpatient hospital claims for a one week period in January of 1983 (pre-period) and 1984 (post-period). The sample includes only hospitals that were eligible for contracting during the first year of contracting and thus excludes hospitals in areas where contracting is not in effect and certain specialty, Children's and federal hospitals.

contract hospitals (1.8 percent). This appears to be true after contract implementation as well (non-contract: 5.7 percent; contract: 1.8 percent).

Examining mortality rates for selected diagnoses does not reveal negative impacts on patients either. Overall, about the same proportion of patients with conditions related to childbirth or pregnancy (normal delivery, single liveborn, perinatal conditions relating to morbidity and mortality), with heart conditions (heart failure, AMI), and with pneumonia died within thirty days of admission during both time periods. However, 30-day mortality rates for patients with heart failure treated in non-contract hospitals increased significantly. Prior to contracting, no patients died from heart failure, whereas after contracting almost 1 percent of patients in non-contract hospitals died within thirty days of admission from this condition. Again, this is not a necessarily an indication of a negative outcome since after contracting started the non-contract hospitals only received urgent cases with a higher probability of death.

2.2.6 Expenditures and Savings

Selective contracting has achieved substantial savings in Medi-Cal expenditures. Table 2.10 shows the average payments per day paid to all hospitals eligible for contracting, as computed from the one week claim samples previously described. All figures are in terms of 1983 dollars. These payments to all eligible hospitals declined 19 percent between the periods before and after contracting. Payments per day to contract hospitals declined by the same order of magnitude. Non-contract hospitals experienced a 37 percent decrease in payments per day. The degree of reduction was not equal across all hospitals or types of hospitals. Table 2.11 shows average payments per day by hospital ownership and peer group. The table shows that the greatest savings were extracted from state teaching hospitals which exper-

Table 2.10

Medi-Cal Expenditure Changes
Before and After Selective Contracting^{a,b}

	Contract Hospitals (223)		Non-Contract Hospitals (42)		All Hospitals (265)	
	Pre	Post	Pre	Post	Pre	Post
<u>Inpatient Services:</u>						
Inpatient Expenditures (in thousands)	\$15,882	\$14,358	\$1,373	\$222	\$17,255	\$14,580
		-9.6%		-83.8%		-15.5%
Average Cost per Day ^c	\$584	\$475	\$570	\$357	\$584	\$472
		-18.7%***		-37.4%***		-19.2%***
Average Cost per Admission ^c	\$3,019	\$2,405	\$2,981	\$2,002	\$3,019	\$2,397
		-20.3%***		-32.8%***		-20.6%***
<u>Outpatient Services:</u>						
Outpatient Expenditures (in thousands)	\$1,853	\$1,991	\$169	\$120	\$2,022	\$2,110
		+7.5%		-29.0%		+4.4%
Average Cost per Visit ^d	\$59	\$54	\$67	\$56	\$59	\$54
		-8.5%***		-16.4%***		-8.5%***

***Differences for means between the pre- and post- periods are significant at the 01. level.

^aThe analysis is based on a sample of Medi-Cal inpatient and outpatient hospital claims for a one week period in January of 1983 (pre-period) and 1984 (post-period). The sample includes only hospitals that were eligible for contracting during the first year of contracting and thus excludes hospitals in areas where contracting is not in effect and certain specialty, Children's and federal hospitals. All dollars represent constant dollars as of January 1983.

^bThe number of hospitals includes only those hospitals in both the 1983 and 1984 samples.

^cThe means are weighted by the number of admissions.

^dThe means are weighted by the number of visits.

Table 2.11

Medi-Cal Payments Per Day by Ownership and
Peer Group Status^{a, b}

	<u>Contract Hospitals</u> (Hospitals)			<u>Non-Contract Hospitals</u> (Hospitals)			<u>All Hospitals</u> (Hospitals)		
	Pre	Post	Percent Reduction	Pre	Post	Percent Reduction	Pre	Post	Percent Reduction
<u>Ownership</u>									
Non-profit	\$557 (107)	\$436 (107)	21.7%***	\$511 (23)	\$264 (23)	48.3%***	\$556 (130)	\$431 (130)	22.5%***
Investor	596 (66)	465 (66)	22.0%***	682 (16)	557 (16)	18.3%***	599 (82)	468 (82)	21.9%***
County	617 (21)	552 (21)	10.5%***	-	-	-	531 (21)	494 (21)	10.5%***
City/county/district	515 (24)	419 (24)	18.6%***	727 (3)	584 (3)	19.7%***	515 (27)	419 (27)	18.8%***
UC/State	711 (5)	528 (5)	25.7%***	-	-	-	711 (5)	528 (5)	25.7%***
<u>Peer Group</u>									
Teaching	655 (20)	528 (20)	19.9%***	779 (1)	235 (1)	-	655 (21)	527 (21)	19.5%***
Lrg Complex	545 (49)	447 (49)	18.0%***	490 (14)	283 (14)	42.2%***	544 (63)	444 (63)	18.3%***
Mod Sized	579 (63)	443 (63)	23.5%***	545 (18)	455 (18)	16.5%	578 (81)	444 (81)	23.2%***
Small Urban	537 (67)	462 (67)	14.0%***	725 (5)	493 (5)	32.0%***	539 (72)	462 (72)	14.3%***
Rural	480 (4)	439 (4)	8.5%***	1324 (1)	1232 (1)	-	536 (5)	491 (5)	8.4%***
Other	513 (20)	465 (20)	9.4%***	602 (3)	226 (3)	62.5%***	519 (23)	448 (23)	13.7%***

***Differences between time periods are significant at the .01 level.

^aThe analysis is based on a sample of Medi-Cal inpatient and outpatient hospital claims for a one week period in January of 1983 (pre-period) and 1984 (post-period). The sample includes only hospitals that were eligible for contracting during the first year of contracting and thus excludes hospitals in areas where contracting is not in effect and certain specialty, Childrens' and federal hospitals. All dollars represent constant dollars as of January 1983.

^bThe number of hospitals includes only those hospitals in both the 1983 and 1984 samples.

perienced about a 26 percent reduction in the average payment per day. Non-profit hospitals, investor owned hospitals, and hospitals owned jointly by the city, county, and/or district experienced similarly significant reductions--23 percent, 22 percent and 19 percent declines in the payment per day respectively. County hospitals, on the other hand, experienced the lowest reduction--about an 11 percent decrease. Small urban and rural hospitals under contracting also experienced lower than average reductions. The negotiations generated convergence in the payments per day. Hospitals with the highest payments per day prior to contracting experienced the largest reductions, while hospitals with lower average payments per day experienced smaller reductions.

The net effect of these lower average payments per day was a drastic reduction in state expenditures for inpatient services. As Table 2.10 shows, the state experienced about a 16 percent decrease in Medi-Cal expenditures for inpatient hospital services for all hospitals, from 17 million dollars in the sample week prior to contracting to about 14.6 million dollars in the sample week after contract implementation. Total payments to contract hospitals decreased about 10 percent, despite the substantial increase in the number of admissions described earlier. As expected, non-contract hospitals, treating only emergency cases under contracting, experienced the greatest reduction in Medi-Cal payments--an 84 percent decrease.

Given the decline in expenditures and average payments per day, it is not surprising that costs per admission also declined. Across all hospitals, the average cost per admission decreased by almost 21 percent, shown in Table 2.10. Contract hospitals also experienced a similar level of reduction in average cost per admission. Non-contract hospitals, with the highest decrease in payments and per diems, experienced over a 30 percent reduction in the average cost of an admission.

It appears that selective contracting may have encouraged hospitals to review their operations and seek economies across all hospital departments. While outpatient services were not covered by the selective contracting program, it is interesting to note the changes in expenditures for these services. As Table 2.10 also shows, over all hospitals, there was a 4.4 percent increase in expenditures for outpatient care. Contract hospitals experienced about an 8 percent increase in payments for outpatient services while non-contract hospitals experienced the highest reduction in payments, a 29 percent decrease. Again, this latter result is not that surprising given the confusion by patients as to where they could receive care and hospitals' concern about continuity of care and referring Medi-Cal patients to contract hospitals. A surprising result, however, is the decrease in the average cost per outpatient visit over both types of hospitals. Over all hospitals and among contract hospitals, there was about a 9 percent decrease in the cost per visit. Among non-contract hospitals, the average cost per visit decreased by 16 percent. There were no changes in the outpatient fee schedules that would have accounted for these reductions in treating outpatients.

How do these savings, as estimated from one week claims samples, translate into annual savings for the Medi-Cal program? One simple method for analyzing the savings would be to multiply the 622 dollar difference in treating admissions between the sample periods by the annual number of patients in 1984. This approach results in about a 249 million dollar savings due to contracting (after adjusting for eligible hospitals not filing claims

in both sample weeks).¹² However, this method is dependent on the number of patients admitted in January and as a result, it is probably an overstatement.¹³

A second method for determining the change in payments due to selective contracting is to compare actual 1984 expenditures (in terms of inflation adjusted 1983 dollars) with the expenditures predicted for that year by a regression equation which takes account of hospital characteristics. Using 1983 data, we estimated a linear regression of the form:

$$Y = a + bX$$

where Y is Medi-Cal expenditure on an admission and X is a vector of characteristics of the admitting hospital. The vector consists of bedsize, ownership, average length of stay, occupancy rate, a dummy variable denoting the claim's major diagnostic category, and a dummy variable denoting whether or not the hospital subsequently won a Medi-Cal contract. Data for 1984 were then applied to the coefficients of the regression to obtain predicted total expenditure (\hat{Y}_{84}) for each hospital. The difference summed over all claims of Y_{84} minus the sum of \hat{Y}_{84} represents the joint effect of what California saved from (1) directing patients to the contracting hospitals and (2) paying contracting hospitals at the (lower) negotiated rates. Table 2.12 reports our results. Using this approach, we found that the selective contracting program realized savings of 3.4 million dollars in the sample week or 174 million

¹²The calculation is as follows: $(\$3019 - \$2397) (6083 \text{ admissions}) (52 \text{ weeks}) (335/265) = \$248,719,868$. The latter multiplier accounts for the 70 eligible hospitals that are not represented in both the 1983 and 1984 one-week samples.

¹³Admissions in January tend to be slightly higher (accounting for about 8.5 percent of all admissions) than in other months. The 249 million dollar estimate is slightly higher than the FY 1984/85 estimate of 183 million dollars calculated by the California Department of Health Services, Selective Provider Contracting Program, Annual Report, July 1986.

Table 2.12

Actual and Estimated Medi-Cal Expenditures^a
For a One-Week Period in 1984

	<u>Actual Expenditures</u> <u>(January 21-28, 1984)</u> (in thousands)	<u>Estimated Expenditures</u> <u>(January 21-28, 1984)</u> (in thousands)	<u>Difference</u> (in thousands)	<u>Percent</u> <u>Difference</u>
Unweighted	\$14,416	\$17,772	\$3,355	23.3%
Re-weighted ^b	\$14,416	\$14,560	\$144	1.0%

^aBased on 6008 admissions during January 21-27, 1984. Coefficients from 1983 regressions were used to estimate the 1984 expenditures.

^bAdjusted for changes in hospital use patterns.

dollars annually. This is a savings of 23 percent compared to what expenditures would have been without selective contracting. We also re-weighted our data to simulate what expenditures would have been if non-contracting hospitals had been allowed to treat patients in the same proportionate volumes as in 1983. We found that under such circumstances, savings to Medi-Cal would have been only 144,000 dollars (one percent) in the sample week, or 7.5 million dollars annually. This finding suggests that selective contracting achieved important savings by directing patients to winning hospitals.

2.2.7 Financial Impacts on Hospitals

In this section we examine the financial impacts of selective contracting from two perspectives. First, what were the financial characteristics of the hospitals which were awarded Medi-Cal contracts? Were these hospitals more solvent, better managed, more dependent upon Medi-Cal revenues, larger, or more oriented toward teaching than hospitals which were not selected? Second what were the financial impacts of selective contracting on these hospitals? Were the Medi-Cal contracts a financial burden or benefit to those hospitals which won them?

To examine these issues, we computed financial statistics for hospitals which were subject to the selective contracting process. All data were obtained from the annual cost reports filed by hospitals in the state as described earlier in this chapter. Data for hospital fiscal reporting periods ending in 1982, 1983, and 1984 were examined. These three years respectively embrace the period immediately prior to, during, and after the implementation of selective contracting.

Six financial operating ratios were examined. These were:

Current Ratio (CR) - Defined as the ratio of Current Assets (CA) to Current Liabilities (CL). That is, $CR = CA/CL$. This is a measure of basic financial solvency or the ability

to meet financial obligations. Increases in this ratio are generally a sign of good financial health.

Operating Margin (OM) - Defined as the ratio of the difference between Operating Revenues (OR) and Operating Costs (OC) to Operating Revenues. That is, $OM = (OR - OC) / OR$. This is a measure of the "profitability" of current operations in terms of the markup of operating revenues over operating costs. Increases in this ratio are generally a favorable sign for a hospital.

Debt Ratio (DR) - Defined as the ratio of Total Debt (TD) to Total Assets (TA). That is, $DR = TD / TA$. While increases in this ratio should be viewed with caution by a hospital administrator, the optimal level of this ratio is dependent upon factors such as prevailing interest rates, and the likelihood that debt obligations owed to the hospital will be paid.

Leverage Ratio (LR) - Defined as the ratio of Net Long Term Debt (NLTD) to Total Assets (TA). That is, $LR = NLTD / TA$. Again, the optimal value of this ratio is dependent upon prevailing interest rates, the quality of the hospital's accounts receivable, and the extent to which owners may wish to carry debt in order to provide the hospital with operating capital. However, increases in leverage generally should be viewed with caution.

Gift Ratio (GR) - Defined as the ratio of Gifts (G) to Net Revenues (NR). That is, $GR = G / NR$. In general, higher values of this ratio suggest that a hospital has income which can act as a subsidy to operating revenues. If gift income is large and stable from year to year, it helps to dampen problems caused by fluctuations in operating revenue.

Uncompensated Care Ratio (UC) - Defined as the Sum of Bad Debt (BD) and Charity Care (CC) divided by Net Revenues. That is $UC = (BD + CC) / NR$. Higher values of uncompensated care are generally a financial drain upon hospital resources. The optimal level of this ratio will vary with the goals of the institution. A profit-seeking hospital should generally try to keep this ratio as low as possible; a government or church affiliated non-profit hospital may explicitly seek to give a certain amount of uncompensated care.

Table 2.13 shows the mean values of these ratios for hospital reporting periods years 1982 through 1984 for those California hospitals which were subject to selective contracting. In the table, the term "Contract" hospital refers to a hospital which was eventually awarded a Medi-Cal contract, while a "Non-contract" hospital is one which did not win a

Table 2.13

Mean Values of Financial Characteristics of Contract and Non-Contract
Hospitals in California for Fiscal Years 1982-1984

Fiscal Year	1982	1983	1984
		Debt Ratio	
Non-Contract	0.699	0.647	0.650
Contract	0.607	0.640	0.672
		Operating Margin	
Non-Contract	-0.008	0.006	-0.004
Contract	-0.038	-0.043	-0.054
		Current Ratio	
Non-Contract	1.591	1.645	1.952
Contract	1.828	1.764	1.752
		Leverage	
Non-Contract	0.301	0.294	0.345
Contract	0.293	0.285	0.308
		Percent of Care Uncompensated	
Non-Contract	0.040	0.031	0.037
Contract	0.048	0.053	0.153
		Percent Revenue from Gifts	
Non-Contract	0.000	0.001	0.000
Contract	0.001	0.001	0.004
		Number of Hospitals Reporting Data*	
Non-Contract	90	89	89
Contract	244	245	254

*Number of usable observations varies slightly for individual statistics.

contract. As the table shows, mean values for all of these ratios were quite similar for both the contract and non-contract hospitals in all of the reporting periods. Not shown in the table is the fact that both groups displayed fairly wide variances in all of these measures. Formal statistical tests (t-test of the difference in means; Bartlett's Test for homogeneity of variances) found no significant differences between contract and non-contract hospitals. These findings suggest that the state did not tend to award contracts to hospitals which were relatively better or worse off financially than other hospitals. Conversely, it suggests that hospitals which were in relatively poor financial condition were not necessarily more likely to make offers to the state which resulted in the award of a contract.

Selection of Winning Bidders

To examine which hospital characteristics were associated with winning a Medi-Cal contract, we undertook a statistical analysis which related the probability of winning a Medi-Cal contract to various characteristics of a hospital. Our analysis sought to determine how factors such as prior experience in treating Medi-Cal patients, teaching status, or the financial condition of the hospital may have affected the chance of winning a Medi-Cal contract.

The statistical method used was Probit analysis (Amemiya, 1981). The dependent variable in the analysis is a dummy variable which equals 1.0 for a hospital which won a contract and zero otherwise. In the context of a Probit analysis, this dummy variable can be interpreted as the probability of winning a contract as a function of other variables which are distributed as a cumulative normal distribution.

Explanatory variables in the Probit regression included the hospital financial ratios previously presented. These were included to see if financially stronger hospitals were more likely to be winners of Medi-Cal con-

tracts. Financially stronger institutions might have been expected to be winners because 1) they were better managed and consequently could afford to offer the state a more favorable price and 2) Medi-Cal may have wished to avoid the risk of awarding contracts to financially weak hospitals which might be more likely to default on their contracts. A finding that financially stronger hospitals were less likely to be winners could be interpreted to suggest that these hospitals were more astute bidders who resisted the temptation to bid below cost. Below-cost bidding is a common mistake made by inexperienced bidders and by organizations which have inadequate information regarding their actual costs.

Explanatory variables in the analysis also included the percent of revenue which a hospital had received from Medi-Cal in the previous year, the hospital's average occupancy rate, and the number of emergency room visits made to the hospital in fiscal year 1983. The first two variables were included as measures of the hospital's potential need for winning a contract. Our earlier case study of California (Koetting and Olinger, 1984) had shown that hospitals with large Medi-Cal volumes or low occupancy rates were particularly eager to win these contracts in order to preserve a source of revenue and to fill empty beds. These considerations suggested that the Medi-Cal revenue variable would have a positive sign in the Probit regression while the occupancy rate variable would have a negative sign. That is, hospitals with little dependence on Medi-Cal or high occupancy rates would not bid as low as those in the opposite situation.

We also included in our analysis the number of emergency room visits to the hospital. This variable served to measure both the availability and relative magnitude of emergency room service. Presumably, a hospital with an existing emergency room program would be more attractive to Medi-Cal since it

could provide this service. A positive sign on this variable was accordingly expected.

Other independent variables for the Probit equation were a series of dummy variables describing the hospitals in terms of their peer group, ownership, and service speciality as classified by the state of California. These variables were included in the regression to control for systematic differences which may occur across different types of hospitals. For example, one might expect that for-profit hospitals would have higher leverage and lower values of uncompensated care than would hospitals operated by county government simply because of differences in their missions and tax status.

The peer group designations included 1) university affiliated teaching hospital, 2) non-university teaching hospital, 3) large hospital with complex casemix, 4) moderately complex casemix, 5) small urban hospital. (Useable data were not available for "rural and other" hospitals.) Ownership categories include 1) non-profit, 2) for-profit, 3) county, 4) city/county/district and 5) University of California/State. Service speciality categories include 1) general medical/surgical, 2) psychiatric, 3) pediatric, 4) rehabilitation and 5) other. Our regressions used a non-profit, moderately complex, general/medical surgical hospital as a reference case to be measured by the constant term in the regression; dummy variables were used for all other categories (dummy = 1 if the hospital falls in the category, = 0 otherwise).

The Probit regression was estimated using data for hospital fiscal year 1983. This means that the regression is based upon one year of cross sectional data corresponding to the year in which contracts were awarded. The approach assumes that any decisions made by the state about awarding a

contract were based upon the current financial and operational status of the hospital (including, as described, the extent of the hospital's prior Medi-Cal involvement).

Table 2.14 presents the results of the Probit analysis. The Probit regression reveals that the financial characteristics of the hospitals had no statistically significant association with winning a Medi-Cal contract. In the regression, the Current Ratio, Operating Margin, and Leverage Ratio coefficients are each statistically insignificant at a 90 percent level of confidence using a two tailed test. (The two tailed test is appropriate here because we can attach an interpretation to why financially strong institutions might have either been favored to win or not to win under selective contracting.) However, the Debt Ratio was statistically significant (at the 90% level) with a positive coefficient. This finding suggests that the state did favor making awards to more indebted institutions or, alternately, that such institutions more frequently presented offers which were acceptable.

The main factor which explains whether a hospital received a Medi-Cal contract is its past involvement with the program as measured by the percentage of hospital revenues which were derived from Medi-Cal in 1982. In the regression, the coefficient on this variable is positive and statistically significant at the 99 percent level, indicating that hospitals which were highly dependent on Medi-Cal tended to be successful bidders.

For-profit hospitals tended to be unsuccessful in obtaining Medi-Cal contracts. The negative sign on the coefficient for the dummy variable indicates that proprietary hospitals tended to be unsuccessful bidders. This may reflect the unwillingness of for-profit hospitals to make significant price concessions in the negotiating process. It may also reflect an unwill-

Table 2.14
Binary Probit Analysis of Winning A Medi-Cal Contract

Dependent Variable: Contract (=1 if Contract won, = 0 otherwise)

Independent Variable	Means		B	T
	No Contract	Contract		
CONSTANT	1.000	1.0000	-1.008	-1.656
Financial Ratios				
Current	1.673	1.7186	.091	.954
Operating Margin	.021	-.0309	.313	.386
Debt	.627	.6370	.830	1.853*
Leverage	.303	.2808	-.340	-.796
Percent of Revenue				
from Medi-Cal	.010	.1807	4.116	4.129***
from Gifts	-.000	-.001	-15.730	-.519
Occupancy Rate	.587	.597	1.355	1.938*
Emergency Visits	11311.740	12739.148	-.001	-.820
Peer Group Dummies				
University Teaching	.000	.030	2.604	.418
NonUniversity Teaching	.012	.047	.192	.288
Large Complex	.244	.201	-.143	-.590
Small Urban	.330	.320	-.028	-.128
Ownership Dummy				
For-Profit	.500	.312	-.524	-2.333**
County	.000	.068	2.027	.886
City/County	.048	.115	.643	1.872*
UC/State	.000	.026	-.484	-.071
Speciality Dummies				
Psychiatric	.000	.0128	2.048	.384
Pediatric	.000	.0043	2.383	.248
Rehabilitation	.024	.0043	-1.513	-1.907*
Other	.012	.0256	.050	.084
Number Of Observations:		316		
Number with No Contract (= 0)		82		
Number with Contract (= 1)		234		

-2 times log likelihood ratio (chi squared): 56.108713
with 20 degrees of freedom

Number Of Cases: 334

Log Likelihood: -152.8640638821

B - regression coefficient

T - t-Statistic

*Statistically Significant at the 90 Percent Level of Confidence

**Statistically Significant at the 95 Percent Level of Confidence

***Statistically Significant at the 99 Percent Level of Confidence

lingness by these hospitals to bid at prices which they might have considered to be below their level of costs.

Rehabilitation hospitals also tended to be unsuccessful bidders. This is indicated by the negative coefficient in the Probit equation. Only one of three rehabilitation hospitals subject to selective contracting was successful at winning a Medi-Cal contract. This result seems to be an anomaly of the contracting process. The State initially included rehabilitation hospitals in the selective contracting program but later chose to exclude them. The rehabilitation hospitals may not have bid very aggressively in light of the state's primary interest in contracting with general acute care hospitals. An alternative interpretation of this finding is that these facilities were relatively expensive and the state preferred to try to shift work toward other less expensive hospitals. Our discussions with state officials did not reveal, however, any such efforts at redirecting patients.

Our analysis does not show any tendency for teaching hospitals to be more successful than other hospitals at winning Medi-Cal contracts after controlling for the volume of Medi-Cal business. In Table 2.14, the dummy variables for a University Teaching Hospital and for a Non-university Teaching Hospital are both statistically insignificant. (To test this specification, a single dummy variable representing both the University and non-university hospitals was also used; again, no statistically significant effect for teaching status was found.) Our results are contrary to earlier findings (Brown, Cousineau and Price, 1985) in which the award of Medi-Cal contracts in the Los Angeles County area was examined. The authors found that teaching hospitals in the Los Angeles area were more likely to win Medi-Cal contracts after controlling for other factors including the percentage of revenues previously derived from Medi-Cal. Our findings suggest that their results may not be generalizable beyond the Los Angeles area. (We were also not able to

confirm the findings of Brown, Cousineau and Price concerning the tendency of teaching hospitals to win contracts when we estimated our Probit equation for only Los Angeles hospitals. For Los Angeles we found essentially the same results as in our state-wide analysis.)

Our analysis does not show any tendency by government operated hospitals to be more successful at winning contracts, after controlling for the volume of Medi-Cal business. None of the dummy variables for government ownership was statistically significant.

Hospitals with higher occupancy rates were more likely to be successful bidders. This is indicated in the regression by the fact that the hospital occupancy rate is significant (at the 90% level) and positive in sign. The finding suggests that hospitals with low occupancy rates did not necessarily offer the state the lowest bids or, alternately, that the state was careful about awarding contracts to hospitals with occupancy problems.

The number of hospital emergency room visits had no statistically significant effect on determining which hospitals won Medi-Cal contracts.

In summary, past experience with Medi-Cal was the most important factor which contributed to a hospital winning a Medi-Cal contract. This finding suggests that hospitals with a large volume of Medi-Cal business were reluctant to lose this revenue and they may have consequently offered the state the most attractive bids. Alternately, the results suggest that large volume Medi-Cal hospitals were also the most knowledgeable bidders about the costs of treating Medi-Cal patients. This experience may have given the hospitals an advantage in determining the price which they should offer the state in the negotiation process. Further, the results suggest that the state may have been more inclined to accept the bids of historically large Medi-Cal suppliers, whatever their bid price--a possibility that implies the state refrained from fully exercising its market power as a buyer, as it sought to

balance against savings the competing claims of access and availability of service. Since the state has not released any information concerning the bids themselves, it remains a matter of speculation whether the state rejected any bids which were regarded as too low or what selection criteria ultimately prevailed. Such bids might have been rejected if they came from bidders who were relatively inexperienced at treating Medi-Cal patients and thus did not make credible offers.

Effects of Contracts on Hospital Financial Condition

To examine more formally the effect of selective contracting upon hospital financial condition we estimated ordinary least squares regressions using pooled time-series cross-sectional data for the three fiscal years. The data covered both hospitals which won contracts and those which did not. Dependent variables were four of the financial ratios (Current Ratio, Operating Margin, Debt Ratio, Leverage Ratio). While it may be argued that all of the financial ratios are potentially the outcome of selective contracting and other exogenous factors, we felt that it was more realistic to view these four as being endogenous and two other ratios--Gifts and Uncompensated Care--as being exogenous in the short run. We viewed Gifts as exogenous because a hospital's ability to attract gifts depends upon a mixture of random generosity and a long term program of fund raising. We consequently doubted that gifts could have been affected seriously in the short run by whether or not a hospital had won a Medi-Cal contract. However, the presence of substantial gift income would affect the character of an institution, and it might mitigate the effect of any Medi-Cal contract on the four ratios which we considered to be endogenous.

Similarly, the uncompensated care ratio is treated as exogenous in the sense that public policy relating to Medicaid eligibility will tend to affect this ratio in the short run in a manner that a hospital cannot immediately

control. In the longer run, it may be argued that uncompensated care is endogenous since a hospital can change its mix of services (e.g. it may close its emergency room to discourage the arrival of patients who have no regular physician and possibly no health insurance).

To measure the impact of a Medi-Cal contract, we computed the percent of days in which a hospital held a contract in fiscal year 1984. This variable was used as an independent variable in the regressions. (The variable equalled zero for all hospitals in 1982 and 1983; for non-contract hospitals it remains as zero in 1984). This approach allowed us to control for the fact that contracts were phased in at different times across the state. For contract hospitals in 1984, this variable ranged in value from 30 percent to 60 percent for about two-thirds of the hospitals.

To control for any systematic time trends, a TIME variable was defined, equal to 1 for 1982, 2 for 1983, etc.

Table 2.15 presents the regression results. Our regressions have very low explanatory ability for the current ratio ($\bar{R}^2 = .035$) and the Leverage ratio ($R = .074$) but better ability for Operating Margin ($\bar{R}^2 = .373$) and the Debt Ratio ($\bar{R}^2 = .147$). The number of months with a Medi-Cal contract is statistically significant only in the regressions for Leverage and Debt. In both cases the coefficient is positive, indicating that hospitals which won Medi-Cal contracts tended to have more debt and more leverage during the period of operating under a Medi-Cal contract. The regression indicates that a hospital which operated for a full year with a contract tended to have a debt ratio which was 17 percent higher than a non-contract hospital. (The mean value of the debt ratio for non-contract hospitals is .65 in Table 2.13. Adding to this the regression coefficient of .11 means that contract hospitals operating for a full year under a contract would on average have a debt ratio of 0.76 vs. 0.65 for non-contract hospitals.) For the Leverage

Table 2.15

Regressions of California Hospital Financial Ratios in Fiscal Year 1984

Independent Variable	Current Ratio		Operating Margin		Debt Ratio		Leverage	
Dependent Variables	COEFF	T	COEFF	T	COEFF	T	COEFF	T
Constant	1.555	13.15a	0.083	3.39a	0.593	14.49a	0.324	12.04a
Contract Months	-0.204	-1.30	-0.036	-1.13	0.110	2.04b	0.069	1.95b
% Care Not Compensated	-0.048	-1.00	-2.271	-16.77a	0.009	0.58	-0.006	-0.59
% Gifts	-3.144	-1.09	1.764	2.74a	1.273	1.27	0.324	0.49
Peer Dummies								
University Teaching	-0.095	-0.25	0.130	1.83c	0.117	0.88	0.032	0.37
Non-University Teaching	0.259	1.23	0.051	1.23	-0.048	-0.66	-0.046	-0.96
Large Complex	-0.132	-1.33	0.036	1.78c	-0.086	-2.51a	-0.025	-1.12
Small Urban	0.037	0.42	-0.064	-3.56a	0.085	2.79a	0.022	1.11
Speciality Dummies								
Psychiatric	0.042	0.10	-0.034	-0.40	0.004	0.03	-0.034	-0.36
Pediatric	1.909	2.97a	0.019	0.14	-0.205	-0.92	-0.089	-0.60
Rehabilitation	-0.451	-1.20	-0.031	-0.39	0.093	0.71	-0.231	-2.71b
Other	0.271	1.28	-0.288	-6.89a	-0.040	-0.54	-0.042	-0.86
Ownership Dummies								
For-Profit	0.139	1.61c	0.041	2.33b	0.188	6.33a	-0.001	-0.04
County	0.598	3.30a	-0.162	-4.66a	-0.163	-2.61a	-0.226	-5.50a
City/County /District	0.529	4.14a	-0.038	-1.48	-0.167	-3.77a	-0.097	-3.34a
UC/State	0.173	0.40	-0.181	-2.15b	-0.405	-2.71a	-0.334	-3.40a
Time	0.041	0.78	0.008	0.74	-0.007	-0.37	-0.004	-0.37
-2								
R:	0.035		0.373		0.147		0.074	
N	973		990		972		972	
F-Ratio	3.189		37.751		11.485		5.828	
P	0.000		0.000		0.000		0.000	
Standard Error of Estimate								
Estimate	1.106		0.226		0.382		0.251	

Notes: ^aSignificant at 99 % Level of Confidence^bSignificant at 95 % Level of Confidence^cSignificant at 90 % Level of Confidence

ratio, contract hospitals were on average 20 percent higher. (The mean leverage ratio for non-contract hospitals is 0.345 in Table 2.13. Adding the regression coefficient of .069 to it produces a 20 percent increase.) For the operating margin and the current ratio, having a contract seems to have a negative impact (see the negative regression coefficients) but the results are statistically not significant.

The increase in debt and leverage (and also the weaker indications that the operating margin and current ratio fell) suggest that hospitals which won contracts did so by accepting lower reimbursement. Hospitals which won contracts were apparently not able, in the period covered by these data, to fully offset the reduced reimbursement with improved operating efficiency.

In summary, the hospitals which won Medi-Cal contracts experienced increased debt during the first year of contracting. There is also some weaker evidence that operating margins and the current ratio were adversely affected. All of this suggests that Medi-Cal contracting resulted in pure price concessions by the hospitals which won the contracts.

In the next chapter, we shift our attention from selective contracting to DRG-based reimbursement systems which were also implemented by Medicaid programs in response to OBRA. An overall summary appears in Chapter 4.

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CHAPTER 3

DRGs

3.0 DRG Reimbursement Systems

Medicaid programs in eight states are now using a system of hospital reimbursement based on a Diagnosis Related Group (DRG) and two more will shortly implement such systems. The passage of OBRA made it easier for states to adopt a DRG system for their Medicaid program, and they were further encouraged to do so when Medicare embraced this concept with its Prospective Payment System in 1984.

The essential feature of a DRG system is that a hospital is paid a rate per admission that is set in advance on the basis of a diagnosis. The payment per diagnosis is traditionally determined from a detailed study of hospital historical costs. It is set to cover the average cost of the average admission after adjusting for factors such as teaching status, rural location, inflation and so forth. A hospital that is as efficient as its peers should recover from a DRG system its costs of treating patients; the hospital will profit on some cases which turn out to have shorter than average costs, and it will lose money on other cases with higher than average cost. On average, relatively expensive and inexpensive cases should balance out.

From the perspective of Medicaid, or any other payer using a DRG system, the key feature of the system is that it penalizes those hospitals which have higher than average costs for reasons that--within the adjustment rules of the method--apparently cannot be explained by anything other than inefficiency. Hospitals with costs above those of their peers will lose money under a DRG system while those with costs below their peers will profit. A DRG system thus sets up a strong incentive for inefficient hospitals to either

improve their efficiency or to send unprofitable cases to a more efficient hospital.

The main drawback of a DRG system is that, like all prospective systems, it contains an implicit reward for substandard care. With DRGs, a hospital can collect the full DRG payment even if it renders cursory treatment and an unusually quick discharge. For this reason, a program of case review by an independent party who is charged with discovering inappropriate care is intrinsic to a DRG system.

To determine more fully the experiences of Medicaid with DRG programs, this project undertook studies of the DRG systems in New Jersey and Pennsylvania. New Jersey was selected for study because of the state's early involvement in developing a DRG program; Pennsylvania was selected because it represented a typical situation of starting up a new DRG program. For New Jersey, we undertook an extensive case study (Koetting, Korda and Olinger, 1985) followed by a statistical analysis of hospital financial reports and patient claims. For Pennsylvania, we conducted a case study to learn about the design of the system and its initial experience (Olinger et al., 1986). The program is too recent to permit a statistical analysis to evaluate its outcome.

We briefly summarize the details of these two programs and then present an evaluation.

3.1 All Payer DRG Reimbursement in New Jersey

New Jersey currently operates under an all-payer hospital reimbursement system which was established in 1980 through state legislation and Medicare and Medicaid program waivers. The New Jersey DRG All-Payer System establishes payment rates for Medicaid, Medicare, Blue Cross, and Private Pay

patients. The state consequently does not participate in the Medicare Prospective Payment System which is a generically similar program of diagnosis based reimbursement. Since New Jersey has nearly four more years of experience with DRG reimbursement than does the PPS program, there is reason to believe that New Jersey's experience may foretell the eventual experience of Medicare.

The current DRG all-Payer system replaces the Standard Hospital Accounting and Rate Evaluation (SHARE) system instituted in 1976. SHARE was a prospective payment system which applied to Medicaid and Blue Cross only. Medicare reimbursed under its own national cost based reimbursement rules, while the other private payers paid hospital charges. The New Jersey DRG system thus is innovative both in its use of diagnostic categories as a method of prospective reimbursement and in the fact that all payers are bound together in a common rate setting methodology.

3.1.1 Implementation in New Jersey

The New Jersey DRG system grew out of concerns about two major issues. First, the previous system regulated hospital rates for only two payers: Blue Cross and Medicaid. As a result, costs were believed to be shifted to other payers, most notably commercial insurers, creating large differentials between Blue Cross and the commercials. Second, several inner-city hospitals with large Medicaid volume and insufficient private payers to whom uncompensated care costs could be shifted were in serious financial difficulty. These two factors created a political climate ripe for a major change in hospital reimbursement.

The political mood coincided with the desire of the Commissioner of Public Health to design a reimbursement system sensitive to casemix. Yale

University was designing a system in which admissions were sorted into diagnostic groups with comparable resource requirements. After many political and tactical efforts involving the legislature, the federal government, New Jersey hospitals, and insurers, the Commissioner successfully operationalized the DRG program. With the help of developmental money from the federal government, the first group of hospitals was phased into the DRG system in 1980, with the remaining hospitals phased-in by 1982.

The DRG program is administered by the New Jersey Department of Public Health (DOH) with an oversight commission responsible for making final rate determinations, including hearing all appeals by hospitals and payers. The Medicaid agency is separate from the DOH, pays only a small portion of state-wide inpatient expenses (between 8 and 9 percent in 1983), and is considered simply as another payer--and not a particularly influential one--in New Jersey's all-payer DRG system. As such, Medicaid receives little or no preferential treatment. The Medicaid agency itself considers the DRG system to be DOH's responsibility and devotes little analytic or policy effort to it. The agency has thus done little to exploit what leverage it might have had.

Like other DRG systems, the New Jersey system is designed around the 468 diagnostic groups used to classify patients into groups with similar clinical and resource requirements. Accordingly, many of the actual mechanics of the reimbursement system involve identifying costs from a base period and allocating them to specific DRGs. The New Jersey system, however, differs from Medicare and other state DRG systems in five important ways:

- Each hospital is paid a DRG rate which is a blend of its own costs and a statewide standard DRG rate. The blending formula is much more sensitive to individual hospital costs than are formulae in DRG programs subsequently

developed by Medicare and by other state Medicaid programs.

- Outliers (primarily cases with unusually long lengths of stay) have typically accounted for 30 percent of the New Jersey cases, whereas other systems allow drastically lower proportions of outliers.
- Uncompensated care is a reimbursable cost under New Jersey's DRG system.
- All payers, including Medicare, Medicaid, Blue Cross, and commercial insurers, are under New Jersey's DRG system.
- Compliance with the New Jersey system is specifically measured against an aggregate revenue cap, in contrast to a system simply allowing the revenue collected from the DRG rates to determine the aggregate allowable revenues.

The net effect of these differences is a system much more sensitive to individual hospital financial requirements, but also much more complex and with weaker cost containment incentives. These differences reflect the state's commitment to equity among hospitals and payers. The overall complexity of the system has been cited by many observers as one of the system's major problems.

3.1.2 Formula for DRG Payments

An important feature of the New Jersey system is that the costs of uncompensated care are shared in the rates. That is, Medicaid and Medicare pay for a portion of a hospital's uncompensated care. This departs from the traditional rationale that Medicaid and Medicare have no "bad debts" of their own because they always pay their own bills. Philosophically, both programs now recognize that bad debts are part of a hospital's cost of being in business and they accordingly pay for a part of these costs.

An implication of this approach is that an all payer DRG system may have rates which are higher those which might be obtained for one or a few payers from systems of competitive contracting. In the latter systems,

hospitals might be willing to quote bargain rates (i.e. marginal costs) in order to obtain Medicaid business, with the costs of bad debt shifted to other payers. In New Jersey, the Medicaid program is committed to paying its fair share of bad debt.

The actual rate setting procedure in New Jersey is very complicated, taking into consideration the variance in costs within a DRG and across hospitals, and across different classes of hospitals. To calculate the rate for a particular DRG, the direct patient costs in each hospital are determined, and the mean and coefficient of variation are calculated. Then all other hospital costs are determined, including indirect patient care costs, depreciation and interest, and either return on equity or a "capital facilities allowance". Included in these indirect costs are costs required for debt service requirement and associated financing cost of a hospital's capital facilities. Also included in the calculations is the cost of uncompensated hospital care, either from charity care or bad debts.

A second major feature of the system greatly complicates the process and considerably changes the incentives the hospitals face. Following the determination of the direct and indirect costs of the hospital, the Department of Health establishes not one rate per DRG, but a rate per DRG per hospital. This rate is a weighted average of the statewide costs and the individual hospital costs, with the coefficient of variation (CV) (defined as the ratio of the standard deviation to the mean) within that DRG serving as the weighting factor. Thus, for example, if the CV in a particular DRG is 0.6, then the rate is 40% of the state average and 60% of the individual hospital costs. If the CV is greater than one, then the hospital costs are used. One important feature of this system is that a hospital has more ability to affect its rates than it would if the state did not use a "blended" rate. In partic-

ular, if the hospital has greater uncompensated care or higher capital investment, then its rates will rise. This may provide incentives for hospitals to alter their behavior in undesired ways.

3.1.3 Eligibility Changes in New Jersey

Before attempting to understand the effects of DRGs on the Medicaid program, it is important to understand that as a result of the 1981 Omnibus Budget Reconciliation Act, eligibility and participation in both the AFDC program and the Medicaid program were sharply curtailed. As a result, eligibility and participation in the New Jersey Medicaid program dropped significantly from 1981 to 1983, as shown in Table 3.1. Over this period, eligibility fell by 14 percent from 635 thousand to 549 thousand persons while recipients fell by 8 percent from 313 thousand to 289 thousand persons. These changes in the program would be expected to reduce Medicaid's share of total hospital admissions and patient days. In addition, this constriction of the program might also have an effect on the type of care demanded by Medicaid beneficiaries.

While New Jersey's DRG system offers some generic insights into how a system like PPS might affect hospital behavior in the longer run, we should note that the New Jersey hospital industry is somewhat different from the nation as a whole in the sense that the system is composed almost exclusively of non-profit and government-owned hospitals as shown in Table 3.2. During the period under study, no hospitals were owned by for profit corporations and only a few were managed by the Hospital Corporation of America (HCA). In addition, on average New Jersey hospitals were larger than those in other states. Both ownership and size could have a bearing on the performance of hospitals under the DRG system. Without the incentive to return a profit to

Table 3.1

New Jersey Medicaid Program
Average Monthly Eligibles and Recipients

<u>Fiscal Year</u>	<u>Eligibles</u>	<u>Recipients</u>
1977	636,887	283,710 ¹
1978	634,071	289,457 ¹
1979	625,268	305,761
1980	631,354	309,103
1981	635,119	313,439
1982	590,082	294,952
1983	549,356	289,136

¹By calendar year.

SOURCE: Medicaid Annual Reports, New Jersey Department of Human Services, Division of Medical Assistance and Health Services.

Table 3.2

New Jersey Hospitals

	<u>Number</u>	<u>Percent</u>
Bed Size		
1-99	3	3
100-299	42	46
300+	46	51
Ownership		
Nonprofit	86	94
Investor	2	2
Government	3	4
Location		
Inner City	21	23
Urban	23	25
Suburban	33	36
Rural	14	15
Teaching Status		
Teaching	20	22
Minor Teaching	15	16
Non-Teaching	56	62

investors, hospitals may be less motivated to minimize costs. In addition, sheer size may make it more difficult, or take longer, to alter existing practices. Consequently, results in New Jersey may understate the potential effects of a DRG system in those states where hospitals are smaller or more frequently operated for profit.

Our evaluation of New Jersey consisted of an extensive case study as well as an analysis of financial reports and Medicaid claims. As discussed below, our analysis revealed that the New Jersey all payer DRG program decreased the cost of Medicaid hospital care on both a per day and per admission basis. Average length of stay also decreased. These outcomes resulted in lower total hospital expenditures for the New Jersey Medicaid program. However, admission rates rose under DRGs even though the number of Medicaid eligibles declined. Furthermore, there was a clear change in the mix of Medicaid cases between 1979 and 1983, presumably due to changes in eligibility. The net result has been a slight decline in Medicaid inpatient costs that--but for the decline in the number of eligibles--would in fact have been a slight increase in expense.

3.2 Medicaid DRG Reimbursement in Pennsylvania

The Medicaid Prospective Payment System of Pennsylvania is a DRG based hospital reimbursement program which operates independently from other payers. Unlike the New Jersey All-Payer Program, Pennsylvania Medicaid has not designed its program to pay for a portion of uncompensated care in hospitals. Otherwise, the program is generically similar to the DRG reimbursement approach of the Medicare Prospective Payment System. The state thus offers an example of a DRG system that is dedicated solely to the programmatic needs of Medicaid.

The Pennsylvania DRG system was implemented in July 1984 with provision for a two year phase-in period where payments would depend upon a blend of the DRG rate and a hospital's own costs. The 1986-1987 fiscal year thus constitutes the first full year where reimbursement is fully determined by the DRG payment rate.

The purpose of the Pennsylvania program is to create incentives in the long run for greater economy in treating Medicaid patients. However, the program was designed to initially be reimbursement neutral to hospitals. That is, major program savings were not sought via the initial rate structure.

Early analyses of the program conducted by the state indicate that it has experienced a reduction in length of stay of approximately 16 percent. Further, there has been no appreciable rise in the rate of admissions per eligible (about 215 admissions per 1,000 eligible). There have been substantial increases (about 80 percent) in the percentage of discharges to rehabilitation/psychiatric/personal care homes and a decrease (7.5 percent) in discharges to nursing homes. There has also been a substantial (almost 85 percent) increase in the rate of readmission. Preliminary results also show that the program was more expensive than anticipated with the result that the goal of expenditure neutrality was not achieved.

From the perspective of the Medicaid Program Evaluation, the apparent contrast in the admissions rate experiences of Pennsylvania and New Jersey are striking. New Jersey experienced an increase in admissions in a system where the Medicaid program was responsible for paying for a portion of the costs of uncompensated care; Pennsylvania, in contrast, had no increase in admissions (but a substantial increase in readmissions), in a system where Medicaid assumed no responsibility for uncompensated care. The two contrasting experiences suggest that states should be cautious about allowing their Medicaid

programs to assume an obligation for uncompensated care costs since such an obligation may offset economies in length of stay which seem to be characteristic of a DRG program. That is, when Medicaid agrees to pay for uncompensated care, there is a risk that hospitals may become less careful about collecting their patient debt or screening for a payment capability at the time of admission.

3.3 Evaluation of the New Jersey DRG Program

Our evaluation of the effects of the 1981 OBRA legislation on the Medicaid program's provision of hospital care in New Jersey addressed the following questions:

1. What were the aggregate effects of OBRA and the New Jersey DRG program on Medicaid hospital costs, length of stay, and admissions?
2. How, if at all, did the casemix of hospitals change? To what extent are casemix changes explained by OBRA inspired changes in Medicaid program eligibility versus changes in hospital operations associated with the DRG method of payment?
3. How did hospitals respond to changes in reimbursement under the DRG program? Did they change their mix of professional and non-professional labor? Increase or decrease their use of capital?
4. What were the effects of the DRG program on quality of care?

Results of our analyses on each of these topic areas are discussed below following a brief discussion of our methodology.

3.3.1 Methodology

Our research design for addressing these questions consisted of a pre versus post comparison of state aggregate data and individual hospital data. To take account of both some data deficiencies and perturbations arising from the institution of a new payment program, our analyses focused especially on a

comparison of the years 1979 and 1983. The year 1979 was chosen as the "pre" period because this is the last year in which all hospitals in the state operated under the SHARE reimbursement system. The DRG program was implemented in phases beginning in January 1980 with the issuance of rates for roughly one third of the hospitals (the first claims were paid in May, 1980); the remaining hospitals were phased in over 1981 and 1982. Similarly, 1983 was chosen because it was the first year in which all hospitals operated under the DRG program. In the intervening years, hospitals were gradually being phased out of SHARE and into the DRG program.

A second reason for focusing on 1979 versus 1983 is that hospital cost report data (the SHARE forms discussed below) are sparsely filled out and probably unreliable for the period from 1980 through 1982. (Cost reports for these years had little relevance to actual reimbursement rates due to the transition from SHARE to the DRGs.)

Two primary sources of data are used for the analysis in this report. Both are available from the Health Research and Educational Trust of New Jersey (HRET), which is a part of the New Jersey Hospital Association. One source is the New Jersey Department of Health SHARE forms (hospital cost reports). Information from the forms from 1979 through 1983 was used to form a panel of data in which we tracked approximately 90 hospitals over the five year period. One unfortunate characteristic of these cost reports is that they are not consistently filled out in every year. This occurs because a hospital's actual costs were not as important in the years after the implementation of the DRGs.

The other source of data is the HRET annual Payer Summary Files, which were generated by HRET by aggregating patient claims to the hospital level. These files contain information on utilization, length of stay, patient

status, and type of payer broken down by individual DRGs. Thus we can track the number of patients in a particular DRG admitted to a particular hospital, along with their length of stay and discharge status. Files obtained for this analysis were payer summary files for 1979, 1982 and 1983.

Other data were obtained from the American Hospital Association, the New Jersey Department of Health, and the New Jersey Department of Human Services, Division of Medical Assistance and Health Services. This included statistics on the Medicaid program and information on hospital ownership, teaching status, location, and other relevant hospital characteristics.

With the exception of those elderly persons who qualify for both Medicare and Medicaid, recipients of Medicaid generally do not have substantial coverage from other sources of insurance (Farley, 1985). This fact should help to overcome one shortcoming in our data, namely that in the Payer Summary Files, and for admissions and patient days in the SHARE files, each case is assigned only to the primary payer. In cases where there are two payers, this can result in an incorrect attribution of hospital resources to some payers. This implies that Medicaid will be under represented to the extent that it also is providing coverage for indigent elderly who are also covered by Medicare.

Serious bias in this study could result if a large portion of Medicaid hospital spending went to persons where Medicaid was not the principal payer. Table 3.3 indicates, however, that this is probably not a major concern. While a very large portion of Medicaid spending goes to persons over 65, most of it is spent on long term care institutions. Medicaid also pays the Medicare Part B premium for many persons over 65, but actual hospital care spending for this group appears to be a small portion of all Medicaid spending

Table 3.3

Medical Assistance Expenditures by Type of Service and Category of Eligibility,
Calendar Year 1978 (Thousands)

SERVICE	TOTAL	ASSISTANCE TO FAMILIES WITH DEPENDENT CHILDREN							SSI-RELATED			
		REGULAR			FAMILY		ADULTS		CHILD	DYFS	MAA	CR
		TOTAL	REGULAR	FAMILY	ADULTS	CHILD						
Hospital, Inpatient	137,972	85,361	79,197	3,546	1,631	9874,598	87	88847,038	9,378	37,210	450	
Hospital, Outpatient	36,524	27,852	26,009	1,124	352	367824	5	1497,694	1,006	6,583	105	

DYFS - Division of Youth and Family Services
MAA - Medical Assistance for the Aged
CR - Cuban Refugee

SOURCE: 1978 Medicaid Annual Report, New Jersey Department of Human Services, Division of Medical Assistance and Health Services.

on hospitals. In essence, this means that this study considers the effects of the DRG program on the AFDC and SSI population under the age of 65.

3.3.2 Impacts of the DRGs on Hospital Costs, Length of Stay, and Admissions in New Jersey

Examination of the financial and utilization impacts of the New Jersey DRG system on Medicaid reveals that the all payer DRG program decreased the real cost of Medicaid hospital care on both a per day and per admission basis. Average length of stay also fell over this period. All of these outcomes resulted in lower total hospital expenditures for the New Jersey Medicaid program after adjusting for general inflation. However, the program was not an unqualified success because admission rates rose under the DRG program even though the number of Medicaid eligibles fell.

It appears likely that the reimbursement rules of the DRG program were at least partly responsible for increasing the number of admissions while the decrease in the number of Medicaid eligibles was almost certainly due to changes in program rules independent of the DRG program. The net result is that the New Jersey DRG program would have cost more than the previous program had it not been for a fortuitous decrease in the number of Medicaid eligibles. The effectiveness of DRGs in containing costs may therefore depend on the ability of states to control admissions.

Table 3.4 presents basic utilization and expenditure data for New Jersey in 1979 and 1983. The table is based upon the cost reports of 54 general hospitals which filed reports in both years. The years are chosen because they offered the largest number of comparable cost reports for hospitals in the state. (Recall that 1979 represents the last year of operation under the SHARE reimbursement program while 1983 represents the first year all

Table 3.4

Medicaid Expenditure and Utilization in New Jersey Hospital Sample
1979 and 1983

(All dollars are 1979 equivalents)

	<u>1979</u>	<u>1983</u>	<u>Percent Change</u>
Total Eligibles	625,268	549,356	-12.1
Hospital Average: ^a			
Medicaid Expenditures	\$1,959,492	\$1,829,891	-6.6
Admissions	1,152	1,335	15.9
Patient Days	7,454	7,172	-3.7
Expenditure/ Admission	\$1,642	\$1,360	-17.2
Expenditure/Day	\$244	\$235	-3.7
Length of Stay	6.7	5.7	-14.9

Source: Author's computations based on a sample of 54 hospitals. See text for details.

^aAverages are unweighted. Ratios do not necessarily equal the quotient of their components.

hospitals were under DRG program.) While the sample is not random and caution should be used when drawing inferences, inspection of the sample reveals no anomalies in the proportions of hospitals which are represented by size and location. This suggests that the sample is likely to be representative of all hospitals in the state. All dollar figures are in constant 1979 dollars (deflated by the GNP Implicit Price Deflator). Differences between 1979 and 1983 values are statistically significant at at least the 95 percent level of confidence.

During the 1979-1983 period, the number of Medicaid eligibles also fell by twelve percent, from 625,268 to 549,356. The fall in the number of eligibles was most likely due to factors outside of the control of the Medicaid hospital reimbursement program, namely the changes in eligibility instituted by OBRA and TEFRA previously discussed in another report by this project.¹

As the table shows, average Medicaid hospital expenditures for this sample of hospitals fell by 6.6 percent in real terms, from 1,959,492 dollars in 1979 to 1,829,891 dollars in 1983, representing a drop in Medicaid expenditures per admission from 1,642 dollars to 1,360 dollars. This occurred because of a drop in the Medicaid length of stay from 6.7 to 5.7 days, while cost per day changed very little.

Declining eligibility should mean that the remaining Medicaid population consists of people with worse health status. This would suggest that the rate of hospital admission per thousand eligibles would increase for the remaining eligibles but that the absolute number of admissions would decline due to the smaller number of eligibles. However, in our sample of hospitals

¹Cohen, Joel, and Holahan, John. Medical Eligibility After the Omnibus Budget Reconciliation Act of 1981. Urban Institute, Washington, DC, MPE Paper #5.1, October 1985.

the absolute number of Medicaid hospital admissions rose. This suggests that the number of admissions per thousand eligibles increased following the implementation of the DRG program. The average number of admissions per year increased in our sample of hospitals from 1,152 to 1,335 in spite of the decrease in the number of eligibles. This 15.9 percent rise in Medicaid admissions outstripped the 9.5 percent rise in all New Jersey hospital admissions during the same period.

The implication of these changes is that the DRG program had considerable success in achieving economies in hospital expenditures per admission but these were nearly offset by higher admission rates. Indeed, if the number of eligibles in 1983 had been the same as in 1979, program expenditures would have risen by six percent instead of falling as they did by nearly seven percent. One explanation for the higher admission rate is that hospitals became less concerned about screening patients for their ability to pay as a result of the all payer system. A hospital's bad debts essentially became a liability to other third party payers rather than to the hospital itself. This fact may have encouraged hospitals to be less careful about verifying a patient's ability to pay at the time of admission. Some of these admitted cases may subsequently turn out to be bona fide Medicaid recipients who might otherwise not have been admitted.²

²One caveat in regard to data should be raised here. The admission figures which we use come from hospital cost reports (SHARE forms). Admissions by type of payer are reported by hospitals based upon their best guess at the time of admission of the eventual source of payment. Not all cases initially classified as Medicaid may turn out to be correct. If hospitals became more willing to admit cases with dubious payment capability and if hospitals tended to classify dubious cases as Medicaid, the Medicaid admission figures for 1983 will be overstated compared to final audited admissions. However, any overstatement continues to illustrate the point that the all payer system created an incentive for hospitals to be less careful about screening for financial status prior to admission.

The all payer DRG program in New Jersey thus raises questions about the side effects of such a program on admissions, especially admissions of the indigent. States which undertake to design and adopt Medicaid DRG programs should carefully consider the issue of whether their program should bear a share of bad debt. Rather surprisingly, New Jersey illustrates that a Medicaid program can achieve lower costs even after assuming responsibility for some part of bad debts; however, the assumption of an uncompensated care liability also seems to increase the volume of cases that are admitted and this volume may offset the unit cost savings of the program.

3.4 Financial and Utilization Impacts in New Jersey

3.4.1 Casemix Changes in New Jersey

In evaluating the effect of the DRG program on Medicaid expenditures and utilization, one issue to be considered is how the Medicaid casemix may have changed between the periods before and after the implementation of the DRG program. A second issue of more general interest is how Medicaid patients may differ in terms of casemix severity from those of other payers. As a general economic principle, a reimbursement system should be designed to pay hospitals more money for treating sicker cases. In a DRG system, payments for a particular diagnosis are supposed to be set to cover the costs incurred by the average hospital in treating that case. This approach implies that some hospitals may be relatively inefficient in treating some--perhaps even all--diagnoses with the result that reimbursement for those diagnosis will not cover their actual costs. In such a situation, these hospitals should be placed under pressure either to reduce their costs or to refer cases to other hospitals which are relatively more efficient.

In designing its DRG program, New Jersey took several steps to adjust reimbursement to take account of differences in patient casemix. The most important adjustment was the use of DRGs themselves as the basis for reimbursement, since this system made provision for reimbursing hospitals for 468 separate diagnostic categories. In addition, the state agreed to refine the DRG rates with three separate techniques. First, the state established separate rates for teaching and non-teaching hospitals. Second, the initial DRG rates were blended with a portion of a hospital's own costs by a formula which gave the hospital's own cost more weight as the variance in cost among hospitals increased. Third, the DRG rates applied only to cases where length of stay fell within certain limits; cases with longer lengths of stay were paid on the basis of charges. These adjustment techniques served to increase the perceived fairness of the system but this was done by weakening the incentives which were given to a hospital to either treat the patient for a fixed price or to send the patient to another facility with costs below the DRG level.

In this section we examine how casemix changed in New Jersey in the period after the implementation of the DRG program and how these changes affected Medicaid and other payers. Our basic findings are that 1) the Medicaid casemix is somewhat less expensive than the casemix of other payers; 2) the Medicaid casemix changed as a result of eligibility restrictions initiated by the OBRA legislation but the net effect of these changes was neutral with respect to the relative costliness of the casemix; 3) while the DRG program presented hospitals with incentives to specialize in relatively profitable cases and to avoid treatment of cases where their costs exceeded

reimbursement, hospitals did not significantly alter their patterns of treatment.

3.4.2 Methodology

To examine casemix issues, we used the hospital Payer Summary Files to determine the number of cases by payer by diagnostic category that a hospital treated. In addition, we developed a casemix index for each hospital which measured the percentage of cases in each DRG treated by the hospital weighted by the average DRG payment.³ This index was developed for all payers as well as for Medicaid cases only.

It is possible to identify several points relating to casemix and changes over time. First the pattern of diagnoses of Medicaid patients is very different from that of the general population, including the fact that a large percentage of the Medicaid cases are concentrated in a few categories. Second, the casemix intensity for Medicaid patients is somewhat less severe

³The casemix index is defined as:

$$\frac{\sum_{i=1}^{468} P_i w_i}{\sum_{i=1}^{468} P_i W_i}$$

where

- P = the average payment in the state for DRG i
- w = the percentage of cases in DRG i treated by the hospital
- W = the percentage of Medicaid cases in DRG i treated by all non-teaching hospitals.

Note that P is not the customized DRG payment that is made to the individual hospital after adjusting for teaching status and the variance of hospital costs; rather it is the average payment for all hospitals in the state ("Hospital Standards, 1982 Base Year," N.J. Department of Health, Hospital Reimbursement Program, unpublished and undated). The numerator of the index is essentially a weighted average of what the DRG payments to the hospital would have been if all hospitals were paid at the average DRG rate. The denominator is also a weighted average payment calculated for a particular hospital or group of hospitals that is used as a reference point. In our computations, we defined the denominator as the group of all Medicaid non-teaching hospitals in 1979.

than for the population generally and it has been growing much more slowly than for the general population. Third, there is evidence that hospitals have responded to the change in reimbursements by DRG, but the response is weaker with respect to the Medicaid population.

Differences in the type of hospital use by Medicaid beneficiaries compared to the general population can be seen from Table 3.5 which lists the percentage of all cases in each of the major diagnostic categories for both Medicaid and for all payers. Not surprisingly, the Medicaid population has a much higher concentration of admissions relating to pregnancy, birth and problems of the female reproductive system, as well as respiratory system disorders. From 30 to 35 percent of all Medicaid admissions are related to childbirth. The general population, reflecting the higher percentage of men and of aged, shows a higher concentration of admissions for circulatory and digestive system disorders, as well as diseases of the musculoskeletal system.

In addition to very different patterns of usage, it is important to note that the demands of the Medicaid population are more concentrated in a few areas than is true of the general population. This can be seen in Table 3.6, which respectively list the 15 most commonly encountered DRG categories for both Medicaid beneficiaries and the total population. From Table 3.6 we see that the 15 most commonly used DRGs among the general population account for only about 30 percent of utilization while, among the Medicaid population, they account for about 45 percent of utilization. The two populations share 10 diagnoses in the most commonly used category. The populations differ in that the remaining most common diagnoses for the general population cover heart, back, and gastrointestinal problems while for Medicaid they cover procedures that are gynecological or common to children.

Table 3.5

Percentages of Cases By Major Diagnostic Category
for Medicare and All Payers, New Jersey 1979 and 1983

Year	<u>All Payers</u>		<u>Medicaid</u>	
	1979	1983	1979	1983
MDC Disorders & Conditions of:				
1 Nervous System	5.60	5.60	4.05	3.75
2 Eye	2.04	2.43	1.15	1.10
3 Ear, Nose and Throat	4.59	4.08	5.94	4.51
4 Respiratory System	6.46	6.71	10.11	9.52
5 Circulatory System	10.34	11.34	3.94	3.73
6 Digestive System	11.58	11.17	9.51	8.41
7 Hepatobiliary System & Pancreas	2.83	2.62	2.04	1.76
8 Musculoskeletal & Connective Tissue	9.15	9.34	4.63	4.08
9 Skin, Subcutaneous Tissue & Breast	4.03	4.08	3.22	2.92
10 Endocrine, Nutritional & Metabolic	1.99	2.10	1.96	1.81
11 Kidney and Urinary Tract	3.99	3.54	2.79	2.14
12 Male Reproductive System	1.92	1.85	1.07	.90
13 Female Reproductive System	6.97	5.96	9.42	7.07
14 Pregnancy, Childbirth & Puerperium	11.23	10.86	17.32	22.71
15 Normal Newborns & Other Neonates	8.18	7.99	12.61	14.49
16 Blood, Blood Organs & Immunity	.75	.88	1.01	1.20
17 Myeloproliferative & Neoplasms NEC	1.32	1.73	.49	.61
18 Infectious & Parasitic Diseases	.81	1.02	1.14	1.33
19 Mental Disorders	2.06	1.94	3.22	3.10
20 Substance Use Disorders	.67	.84	.53	.64
21 Injury, Poisoning, & Toxic Drugs	1.39	1.47	1.98	2.09
22 Burns	.19	.14	.33	.28
23 Selected Factors	.34	.53	.36	.28
24 O.R. Unrelated to Principal Diag.	1.64	1.65	1.12	.97
TOTAL	100.00	100.00	100.00	100.00

Table 3.6

Most Prevalent 15 DRG's in New Jersey for All Payers and
Medicaid in 1979 and 1983

DRG	Percent of Cases by Year			
	All Payers		Medicaid	
	1979	1983	1979	1983
14 Cerebrovascular Disorder	1.0	1.1	--	--
39 Lens O.R. Procedure	1.1	1.6	--	--
60 Tonsillectomy/Adenoidectomy Ages 0-17	--	--	1.5	0.7
70 Otitis Media/URI Age 0-17	--	--	1.8	1.3
91 Simple Pneumonia Ages 0-17	--	--	3.0	2.3
98 Bronchitis, Asthma Ages 0 - 17	--	--	4.2	4.2
127 Heart Failure &/O Shock	1.7	1.8	--	--
140 Angina, Medical	1.3	1.7	--	--
182 GastroI Disorder Age 18+ w/ age 70 cc	1.1	1.4	--	--
183 GastroI Disorder Age 18+ w/o age 70 cc	1.5	1.3	1.0	0.8
184 Gastrointestinal Disorder Ages 0-17	1.0	0.9	3.4	2.9
243 Back Disorder Medical	2.5	2.3		
361 Laparoscopy & Endoscopy w/o Tubal Inter			1.1	0.8
364 D& C w/o Malignancy	1.9	1.6	2.7	1.9
371 Cesarean Section w/o complications	1.3	1.5	1.8	2.2
373 Vaginal Delivery w/o Complications	6.0	5.2	9.5	9.6
381 Abortion w/ D&C	1.3	1.2	1.3	3.3
389 Full Term Newborn w/ Major Problem			1.0	1.3
391 Newborn, w/o Secondary Diagnosis	6.8	6.6	10.1	11.3
430 Psychoses, Medical	1.0	1.2	1.8	2.0
468 Procedure Unrelated to Diagnosis	<u>1.6</u>	<u>1.7</u>	<u>1.1</u>	<u>1.0</u>
Total	31.1	31.1	45.3	45.6

-- Not among the 15 most prevalent DRGs.

The Medicaid population is relatively less costly to treat than is the general population. This is shown in Table 3.7 which reports the casemix index for both populations by hospital teaching status. The table is constructed so that the casemix index for Medicaid patients in non-teaching hospitals in 1979 is used as a base (index = 100). All other indices are reported relative to it. For example, the index for the general population treated in non-teaching hospitals in 1979 equals 136. This implies that the general population was 36 percent more costly to treat, relative to Medicaid patients treated in the same type of hospitals. Note that the index is consistently lower for the Medicaid population relative to the general population in each hospital class.

The severity of casemix for Medicaid patients has remained essentially unchanged over the period from 1979 to 1983 while it has grown by 5 to 13 percent for the general population across the various hospital categories. Both of these results seem surprising, but both may be related to the high proportion of childbirths in the Medicaid caseload.

Since the Medicaid population is generally perceived to be more ill than the general population, it is perhaps surprising that their resource demands seem lower. This result probably stems from the one third of all Medicaid admissions related to childbirth. Since these DRG's generally receive a lower payment, this may balance out the demands of other, more ill patients. In addition, the over 65 population is included in the general casemix (since Medicare is their primary payer), and this group probably has a much higher resource demand than the under 65 population.

The increase in casemix severity for the general population corresponds to the experience of most DRG based payment systems, but the constancy of the Medicaid payment rate is somewhat surprising. One possible explanation

Table 3.7

Casemix Index in 1979 and 1983

ALL PAYERS

	<u>1979</u>	<u>1982</u>	<u>1983</u>
Major Teaching	147	152	154
Other Teaching	141	145	148
Non-Teaching	136	152	154
All Hospitals	141	145	137

MEDICAID

Major Teaching	114	116	115
Other Teaching	106	107	106
Non-Teaching	100	98	99
All Hospitals	107	108	107

is in the contraction of the program during this period. When eligibility to the program was reduced, those persons leaving the program may have been the most healthy persons and those with the smallest household size. Those remaining may have been the most ill and the most fertile. Thus the increasing severity of the very ill on the program may have been balanced by the increasing proportion of the Medicaid caseload going to the relatively low hospital resource demands of childbirth DRG's. An alternative explanation, of course, is that reductions in eligibility were not related to casemix.

One problem all researchers face is that there can and do occur real changes in the type of admissions over time, as well as coding changes (sometimes referred to as gaming or DRG creep) in which the same patients would be coded differently. In general, we can break these changes down into two groups, referred to as real changes and DRG creep. It is important to note that the term "DRG creep" carries no necessary normative connotation. This can occur from improved coding practices or from coding changes which increase the hospital's revenues, but are allowed under DRG regulations. A number of factors contribute to real changes and to creep.

Real changes in casemix:

1. Changes in technology that provide procedures that were rare or unknown in an earlier period. This includes such things as increases in transplants or new drugs or chemotherapy.
2. Changes in physician practice patterns which may come about through changes in social or medical practice. Possible cases of this during the relevant period include decreases in the amount of tonsillectomies or hysterectomies performed.
3. Conditions that now are more often treated on an outpatient basis, either for medical or financial reasons. One important example of this during this period is that D and C 's are more often done on an outpatient basis in this period.

Factors contributing to DRG creep:

1. The increasing practice of coding an admission as having complications or comorbidity. One very clear example of this can be seen in the changes in incidence of DRGs 182 and 183 for gastro-intestinal disorders with and without complications, in which the increase in one DRG is mirrored by the decrease in the other.
2. The choice of which among several diagnoses will be the primary diagnosis, and thus the DRG the case is assigned to. This appears to be a major issue in DRG research and one without clear resolution. It is unclear how many cases fall into this category, but it appears to be an important issue in coding practices.
3. The choice of more than one imprecise DRG category for the same condition. Examples of this could be such DRGs as 140 and 143 for Angina and Chest pain.
4. In some cases it appears that there is a choice of whether to code the condition or the treatment, although technically the treatment is a "diagnosis". One important example of this may be occurring with the case of DRGs 62 and 70. Otitis media is an infection in the inner ear and a Myringotomy is the treatment for otitis media.

3.4.3 Hospital Response to DRG Payments

One goal of a DRG program is to encourage hospitals to be efficient producers of health care. Hospitals can respond to the DRG incentives by getting their costs at or below the DRG payment level so that they do not incur a loss on treating a particular diagnosis. Another possible response is to try to attract cases which are relatively profitable and to refer elsewhere cases which are relatively unprofitable. It is an open question as to whether hospitals have enough control over the type of casemix that they treat for this latter strategy to be feasible.

To determine how hospitals may have adjusted their casemix in response to DRG incentives, we conducted two analyses. The first analysis examined how the hospital's "internal" market share changed in response to reimbursement

while the second considered how the hospital's "external" market share responded. We define the internal market share of a particular DRG as the percentage of cases treated in that DRG relative to all cases treated. We define the external market share as the percentage of cases in a particular DRG treated by a hospital relative to all cases in that DRG treated by all hospitals.

To measure the effect of the reimbursement incentives, we defined the Relative Reimbursement Loss as a hospital's reimbursement for the DRG minus its cost. This measures the potential loss (or profit) which a hospital might incur on a DRG. Implementing this calculation was complicated by the fact that the state does not publish actual DRG payments per hospital. However, since the actual DRG payment is based essentially upon the average costs of all hospitals, we simply computed the difference between a hospital's own costs for the DRG with the state wide average cost. In most cases, hospitals with costs above average would tend to incur losses on that DRG, while those with costs below average would tend to profit. This calculation was performed for 1979 which is the last year prior to the start of the DRG program. This can be viewed as a base year from which hospitals had to make decisions about changing their internal market share.

To check the robustness of our findings, we also wanted to measure a hospital's potential loss for a year such as 1983 when all hospital's were on the DRG program and the program was operating on a fairly mature basis. This check posed another data problem because the state collected cost data by DRG only for years up to 1979. For later years, only charge data are reported by DRG. (Recall that in 1979, New Jersey was still setting rates using the cost reports developed by the SHARE system. For SHARE, hospitals had to report costs, hence cost data are available. From 1980 on, the state was operating

under the DRG system and it paid hospitals on the basis of their charges for outliers. Hence only charge data are available for these years.) To accommodate this data problem, we calculated the reimbursement loss for 1983 as the difference between a hospital's own charges for the DRG and the state wide average charge. (Note that this measure is meant to be a proxy for payments made to the hospital under the DRG. Outlier cases with long lengths of stay would be reimbursed at charges, so no loss would have been incurred on these cases.)

To analyze the ability of a hospital to change its internal market share, we selected ten common DRG categories thought to be both relatively important and subject to some hospital control. We correlated hospitals' internal market shares with their reimbursement loss for that DRG. Our expectation was that negative correlations would be found. That is, hospitals were expected to decrease their internal market shares for those DRG's where their costs were high relative to the state average and they were expected to increase their shares in the reverse situation. This correlation analysis was performed both for all payers and for Medicaid cases alone in order to determine if hospitals were more or less able to adjust casemix for Medicaid patients relative to all payers.

Tables 3.8 and 3.9 respectively report the results for all payers and for Medicaid cases only. Our findings indicate that hospitals achieved only a few selective adjustments of their internal casemix for all payers and essentially no adjustment of internal casemix for Medicaid patients. As shown in Table 3.8, the correlation analysis is quite sensitive to whether the reimbursement loss is calculated based on 1979 cost data or 1983 charge data. In only two of the ten DRG's examined is the correlation coefficient statistically significant at at least the 90 percent level of confidence for both

Table 3.8

Correlation of Hospital Internal Market Share with Relative Reimbursement Loss
for All Cases for DRGs with a High Potential for Resource
Reallocation, New Jersey Hospitals 1979 and 1983

DRG #	TITLE	CORRELATION IN 1979	CONFIDENCE INTERVAL	CORRELATION in 1983	CONFIDENCE INTERVAL
033	Concussion, Age 0-17, Medical	-0.220**	0.048	-0.209**	0.058
039	Lens O.R. Procedure	-0.114	0.310	-0.399***	0.000(2)
060	Tonsillectomy and/or Adenoidectomy only, Age 0-17	-0.096	0.398	-0.151	0.181
140	Angina, Medical	-0.076	0.497	-0.159	0.153
198	Total Cholecystectomy, W0 Common Bile Duct Exploration, W0 Age 79 CC	-0.024	0.830	-0.153	0.170
364	D&C, Conization, W0 Principle Diagnosis of Malignancy	-0.136	0.225	-0.413***	0.000(1)
371	Cesarian Section W0 CC	-0.211*	0.092	-0.272**	0.028
373	Vaginal Delivery W0 Complicating Diagnosis	-0.111	0.377	-0.173	0.158
410	Chemotherapy, Medical	0.120	0.379	-0.143	0.213
430	Psychoses, Medical	-0.135	0.233	-0.109	0.341

***Statistically significant at 99% level of confidence.

**Statistically significant at 95% level of confidence.

*Statistically significant at 90% level of confidence.

Table 3.9

Correlation of Hospital Internal Market Share with Relative Reimbursement Loss
for Medicaid Cases for DRGs with a High Potential for Resource
Reallocation, New Jersey Hospitals 1979 and 1983

DRG #	TITLE	CORRELATION IN 1979	CONFIDENCE INTERVAL	CORRELATION in 1983	CONFIDENCE INTERVAL
033	Concussion, Age 0-17, Medical	-0.032	0.791	-0.080	0.519
039	Lens O.R. Procedure	0.040	0.786	-0.044	0.742
060	Tonsillectomy and/or Adenoidectomy only, Age 0-17	0.010	0.932	-0.014	0.914
140	Angina, Medical	0.028	0.823	0.050	0.668
198	Total Cholecystectomy, WO Common Bile Duct Exploration, WO Age 79 CC	-0.033	0.780	-0.081	0.511
364	D&C, Conization, WO Principle Diagnosis of Malignancy	-0.000(45)	0.997	-0.176	0.113
371	Cesarian Section WO CC	-0.305**	0.014	0.033	0.795
373	Vaginal Delivery WO Complicating Diagnosis	-0.021	0.871	0.080	0.533
410	Chemotherapy, Medical	0.090	0.692	-0.098	0.534
430	Psychoses, Medical	0.050	0.725	0.040	0.777

**Statistically significant at 99% level of confidence.

measures of reimbursement loss. In four of the ten cases, the coefficient is significant at at least the 90 percent level of confidence if only the 1983 measure of reimbursement loss is considered. However, the magnitude of the correlation coefficients is small in every case, ranging from $-.11$ to $-.22$ over the four significant cases. Furthermore, in Table 3.9 only one of the correlation coefficients is significant at the 90 percent level; this indicates that hospitals did not change their internal marketshare for Medicaid patients in response to reimbursement incentives.

A similar analysis was performed to see how a hospital's external casemix correlated with reimbursement loss. We computed for each hospital its external market share and relative reimbursement loss on each of the ten DRGs. These numbers were then correlated across all hospitals and all DRGs to yield an overall correlation coefficient. The calculation was repeated using both 1979 cost data and 1983 charge data to proxy the relative reimbursement loss. The calculation was also performed separately for all payers and for Medicaid cases. Table 3.10 reports the resulting correlation coefficients. Again, we find some evidence that hospital's sought to change their casemix for all payers in response to reimbursement incentives but we find no evidence of success in changing their Medicaid market shares. In the table, the correlation coefficient for all payers is statistically significant at the 99 percent level of confidence when the calculation is performed using 1983 charge data to measure the reimbursement loss; it is not significant at at least the 90 percent level when 1979 cost data are used to measure the loss. When the 1983 data are used, the coefficient is -0.13 indicating a fairly weak ability of hospitals to change their market shares. For Medicaid, the correlation coefficients are never significant at at least the 90 percent level.

Table 3.10

Correlation of Hospital External Market Share with Relative
Reimbursement Loss by Payers for New Jersey Hospitals, 1979 and 1983

Year	All Payers	Medicaid
1979	- 0.02	0.01
1983	- 0.13 ***	-0.01

Note: Correlations for 1979 are based upon hospital cost data; correlations for 1983 are based upon hospital charge data. See text for details.

***Significant at the 99 % confidence level

These results do not necessarily mean that hospitals do not attempt to capture shares of profitable markets or that they do not try to leave unprofitable market segments. However, few hospitals seem to be successful in these endeavors. Caution should be used in interpreting these results. Because these are simple correlations, other contemporary changes in the hospital environment or operating conditions have not been taken into account. In particular, it is apparent that Medicaid patient casemix changed from 1979 to 1983 on the basis of eligibility alone. This change could bias the results. A more complex study of changes in hospital market share, controlling for other factors, would be a useful contribution to evaluation of DRGs.

In summary, the results presented here point to different casemixes for Medicaid patients, both before and after the institution of DRG payments. A summary of important changes in the New Jersey Medicaid program from 1979 to 1983 includes:

- The program served a smaller portion of the population.
- Medicaid cases were concentrated in a smaller number of DRGs than the general population.
- Casemix changed dramatically, with a much higher proportion of cases related to childbearing.
- Medicaid cases probably required less resources per case than the general population.
- Hospitals showed limited response to prices among the general population and essentially no price response among the Medicaid population.

3.5 Changes in Hospital Health Care Delivery Patterns

In responding to the financial incentives of the DRG system, hospitals had the opportunity to change their style of practice in order to operate more economically within the limits of the DRG payment. To determine how hospitals may have responded, we compared the mean value of twelve variables which

describe different aspects of a hospitals operation for the years 1979 (before DRGs) with 1983 (after DRGs) . These variables are:

- Hospital beds
- Occupancy rate
- Admissions per bed
- Length of Stay
- Outpatients per Admissions
- Labtests per Admission
- Operations per Admission
- Emergency Room Admissions per Admission
- Medicaid Length of Stay
- Capital Cash Requirement divided by Value of the Physical Plant

Table 3.11 reports changes in the means of these variables for the sample of 54 hospitals. The two most important, and widely expected, changes to occur were a decrease in the average length of stay and an increase in the number of admissions. Both of these are confirmed in the table, where length of stay decreases from 8.45 to 7.45 days and admissions per bed rises from 36.1 to 38.6. The length of stay specific for Medicaid patients also decreased by one day from 6.76 to 5.77 days. The drop in length of stay, however, was of sufficient magnitude to reduce the hospital occupancy rates by more than five percent (from 82 percent to 77 percent), even with the increase in admissions. The one day drop in the length of stay is consistent with other studies of prospective payment systems, but the increase in admissions is contrary to the early findings of Medicare's national PPS.⁴

Table 3.11 also shows a decrease in the ratio of outpatient visits per inpatient admission. This change might be interpreted to show that hospitals attempted to increase their hospitalization of discretionary cases which might

⁴Data from the New Jersey Hospital Association corroborates the findings that New Jersey admissions rose at the same time that national admissions were falling ("Hospital Statistics: Focus on New Jersey," New Jersey Hospital Association, Princeton, NJ, published annually).

Table 3.11

Mean Value of Selected Hospital Statistics for a Sample of 54
New Jersey Hospitals Before and After DRG Reimbursement Program

	<u>Pre-DRG</u>	<u>Post-DRG</u>	<u>T-Test of Difference</u>
Beds	312	356	6.77
Occupancy	82%	77%	-6.96
Admissions/Beds	36.1	38.6	5.07
Length of Stay, All Patients	8.45	7.45	-12.31
Length of Stay, Medicaid	6.76	5.77	-6.77
Outpatients Per Admission	6.70	5.95	-1.91
Lab Tests Per Admission	46.5	44.3	-0.65
Lab Tests Per Outpatient	1.84	1.99	1.49
Uncompensated Care/Total Revenue	4.1%	6.2%	7.49
Operations Per Admission	0.49	0.47	-1.26
Emergency Room Admissions/All Admissions	19.3%	32.8%	2.03
Hospital Cash Req/Value of Physical Plant	7.6%	12.2%	1.61

have been treated on an outpatient basis. However, the fall in this ratio seems to occur simply because its denominator (admissions) was rising more rapidly than the numerator. Outpatient visits actually rose by 8 percent over this period as contrasted with the 22 percent rise in admissions. The relatively small (and statistically insignificant at the 90 percent level) change in lab tests per outpatient visit also suggests no change in outpatient practice patterns. However, there was a large increase in the ratio of emergency room admissions to all inpatient admissions (from 19.3 percent to 32.8 percent). This ratio suggests that emergency rooms may have been a convenient source of short stay (e.g. overnight observation) admissions which would have been profitable under the DRG system. Another possibility is that incoming patients were redirected to the emergency room for pre-admission screening and testing. This would allow hospitals to "unbundle" some of the treatment that would have been paid under the single DRG payment.

One surprising finding is that New Jersey hospitals were adding an average of more than 40 beds per hospital during this period. A probable explanation for this paradox is in the particular structure of the DRG system in New Jersey. Under that system, recall that hospital rates of payment take into consideration the capital cash requirements of the hospital. In fact, the ratio of capital cash requirements (essentially interest on debt) to the total assets of the hospital increased during this period (from 7.6 to 12.2 percent) to almost double their pre-DRG levels. This provision apparently provided incentive for hospitals to become more capital intensive in their operations, along with adding more beds. Indeed, Table 3.12, which presents the yearly volume of certificate of need applications, shows a dramatic increase in Certificate of Need (CON) approvals during the period of change-over to DRG.

Table 3.12

New Jersey Hospital Certificate of Need Approvals, 1971-1984
(in millions)

<u>Year</u>	<u>\$</u>
1971	14
1972	144
1973	121
1974	140
1975	58
1976	47
1977	120
1978	203
1979	199
1980	302
1981	575
1982	351
1983	226
1984	68 ^a

SOURCE: Center for Health Facilities Research.

^aDoes not include Essex County, which has pending applications totaling about \$300 million.

Under a pure DRG program, the rationale for a Certificate of Need program is undermined, because reimbursement is no longer based on the actual total cost of hospitals. The increased level of CON approvals in New Jersey may reflect a belief of all parties that DRG incentives provided adequate discipline on capital expenditures. Unfortunately, New Jersey's actual DRG formulae did not provide the presumed incentives, since they contained provisions for a pass-through of capital expenditures. New Jersey may thus have had the worst of both worlds: a blank check to pay for capital expenditures through DRG formulae, but a CON process that treated CON applications as if the state's DRG system provided inherent capital expenditure discipline. The result: excessive capital spending, fully reimbursed.

It might be hypothesized that hospitals tried to improve their capital stock in order to improve their competitive position in the marketplace. Our previous finding that hospitals were not very successful in changing their internal and external market shares over the period from 1979 to 1983 is not completely inconsistent with this hypothesis. Capital improvement projects imply a relatively long term effort at expanding or improving a hospital's service mix. Our findings only show that hospitals which were already providing a particular service were not successful at achieving substantial changes in the level of service over the period considered.

All types of hospitals showed dramatic rises in their capital cash requirements, as seen in Table 3.13. Recall that treatment of Medicaid patients is concentrated most heavily in teaching, inner city, and urban hospitals. These hospitals, in fact, showed the greatest increase in annual capital spending, both in percentage terms and in absolute terms. Thus, hospitals with the greatest rate increase to pay for capital requirements were

Table 3.13

Average Capital Cash Requirements by Class of Hospital

	Average Annual Capital Cash Requirements (000)		
	Before DRGs	After DRGs	Percent Increase
Teaching Status			
1 Major Teaching	\$946	\$2729	188%
2 Some Teaching	763	1853	143
3 Non-Teaching	622	1322	113
Hospital Location			
1 Inner City	880	2045	132
2 Urban	759	2305	204
3 Suburban	846	1667	97
4 Rural	345	941	173

those with a high percentage of Medicaid patients. Whether this large increase in capital spending came as a result of these hospitals' starting in 1979 with worse facilities than other New Jersey hospitals--and, under the New Jersey DRG system, finally having the ability to pay for improvements--is an issue for further investigation.

3.5.1 Hospital Production and Demands for Inputs

To further examine how hospitals may have changed their use of inputs in response to DRG incentives, we estimated a series of regression equations showing the relation of outputs and inputs. Specifically, we estimated a modified production function for Days of Care produced by the hospital and demand functions for Physician Hours, Non-physician Hours, and Beds.

Each of these equations was estimated by assuming that there were no systematic differences in hospitals other than those represented by the regressors, but that there could be trends across time that should not be attributed to DRGs. For this reason, a series of binary variables representing each year after the 1979 base year were included. In addition, it was assumed that teaching status and rural-urban location would have an effect on hospital choice of inputs so that indicators for these variables were also included.

The hypothesis was that the use of hospital inputs changed with the switch from the older hospital payment system to the DRG regime. To test this, hospital inputs were used to form two variables. The first contained the measure of hospital input use before DRGs and the second contained the use of the input after DRGs. Inputs considered included:

- hours of non-physician employees, including nurses
- hours of physician employees
- number of beds in hospital

- number of lab tests performed
- number of operations performed

In estimating the demand for inputs, very rough measures of prices were developed from the hospital cost reports. Hospitals reported hours of workers employed and their total wage bill, plus fringe benefits, allowing an average wage for employees and physicians to be computed. They also reported their interest and depreciation expenses which, when divided by the number of beds, gives a rough approximation of capital costs.

Table 3.14 gives a measure of the production function that hospitals employed in converting the inputs they use into days of care. One way to interpret these results is that they are measuring the relative contribution of each input into the production of a day of care. The declining occupancy rate shows up here in the rapidly decreasing value of the year dummies and in the fact that each bed represented 224 days of care before DRGs and only 207 days afterward. There appears to be a distinct shift within hospitals away from doctors as inputs and toward other employees, though the coefficients on doctors are not always significant. There also appears to be a less intensive use of lab tests and operations in the hospital. The negative coefficients on the major teaching and the minor teaching status dummies indicate that for a given level of inputs, these hospitals produced fewer days of care. This is not really surprising and is the reason for the medical education allocations commonly given teaching hospitals. The regression also indicates that inner city hospitals may be more efficient in use of resources than suburban hospitals, which in turn appear more efficient than rural hospitals.

When hospitals make decisions about inputs, they consider the cost of those inputs and the amount of output (days of care) they want to produce.

Table 3.14

Regression Equation for Days of Inpatient Care
(T Statistics in Parentheses)

	<u>Before DRG</u>	<u>On DRG</u>
Non-Physician Hours	0.0126 (15.66)	0.0172 (7.03)
Physician Hours	-0.0366 (-2.68)	-0.0152 (-1.03)
Beds	223.933 (15.66)	207.140 (14.35)
Lab Tests	0.0029 (1.75)	-0.0022 (-1.29)
Operations	0.793 (2.35)	0.70 (2.34)
Intercept	440.038 (0.24)	
Major Teaching Status	-4853.76 (-2.55)	
Minor Teaching Status	-3489.56 (-2.34)	
Inner City Hospital	1346.01 (1.03)	
Rural Hospital	-818.03 (-0.52)	
Years After 1979		
1980	-682.77 (-0.49)	
1981	-3979.79 (-2.30)	
1982	-4977.74 (-2.37)	
1983	-6938.77 (-3.09)	
R ² :	0.976	
F Value:	514.717	

The demand for physician and non-physician employees, as well as beds is shown in Tables 3.15, 3.16, and 3.17.

These demand equations attempt to explain what factors are important to the hospital in making decisions about purchasing more inputs. As expected, in the equation for the response of hours (for physicians and non-physicians), wages is negative and significant as theory would predict. However, the elasticities of labor with respect to wages are improbably high (the elasticities are in the range of 15 to 20). According to the regression for Physician Hours, for example, a one dollar rise in wages will prompt the hospital to reduce its staff by about one physician or 30 to 50 other employees. (This assumes that an FTE works a standard 2080 hours per year.) However, Capital Cost seems to have no effect on the demand for hospital beds, which is consistent with what we would predict from the way in which capital costs can be passed through the reimbursement system. Thus hospitals seem to give capital costs a minor weight in determining demand for hospital beds.

There also appears to be a significant amount of substitutability among inputs. The single significant exception to this is that high wages for physicians may have reduced the demand for beds in the pre-DRG period. In general, the smaller coefficients in the On DRG period indicate that hospitals either could not or were less willing to substitute inputs for each other after the institution of DRG. One interesting and significant result is that the sensitivity demand for physicians and other employees to capital cost decreased after the switch to DRG. A rise in capital cost induces only half the change in physician hours after DRG. For other employees, a one dollar rise in capital cost would prompt an extra 40 hours of work before DRG but only 28 hours after.

Table 3.15

Regression for Demand by Hospitals for Physician Hours
(T Statistics in Parentheses)

	<u>Before DRG</u>		<u>On DRG</u>	
Days of Care	0.5896	(4.96)	0.721	(5.20)
Non-Physician Wage	15279	(2.12)	1926	(2.92)
Physician Wage	-2142	(-3.04)	-2970	(-3.82)
Capital Cost	7.52	(5.07)	3.51	(1.78)
Intercept		-113847	(-2.57)	
Major Teaching Status		76448	(6.26)	
Minor Teaching Status		14310	(1.41)	
Inner City Hospital		21451	(2.52)	
Rural Hospital		26503	(2.41)	
Years After 1979				
1980		-7888	(-0.80)	
1981		-6866	(-0.50)	
1982		-25345	(-1.27)	
1983		-31741	(-1.37)	
R ² :	0.69			
F Value:	32.19			

Table 3.16

Regression for Demand by Hospitals for Non-Physician Hours
(T Statistics in Parentheses)

	<u>Before DRG</u>		<u>On DRG</u>	
Days of Care	17.01	(26.89)	16.27	(22.06)
Non-Physician Wage	-106702	(-2.77)	-73799	(-2.10)
Physician Wage	6850	(1.83)	-152	(-0.04)
Capital Cost	40.24	(5.09)	28.30	(2.70)
Intercept		286721	(1.21)	
Major Teaching Status		474982	(7.30)	
Minor Teaching Status		203506	(3.78)	
Inner City Hospital		-9172	(-0.20)	
Rural Hospital		-21455	(-0.37)	
Years After 1979				
1980		72618	(1.39)	
1981		256917	(3.49)	
1982		298605	(2.81)	
1983		360106	(2.92)	
R ² :	0.92			
F Value:	173.29			

Table 3.17

Regression for Demand by Hospitals for Beds
(T Statistics in Parentheses)

	<u>Before DRG</u>		<u>On DRG</u>	
Days of Care	0.0031	(67.01)	-0.00006	(-1.05)
Non-Physician Wage	10.36	(3.73)	1.099	(0.43)
Physician Wage	-0.98	(-3.62)	0.303	(1.01)
Capital Cost	-0.00025	(-0.44)	0.00002	(0.03)
Intercept		-23.5		(-1.38)
Major Teaching Status		13.81		(2.94)
Minor Teaching Status		1.91		(0.49)
Inner City Hospital		2.08		(0.64)
Rural Hospital		0.73		(0.17)
Years After 1979				
1980		-4.10		(-1.08)
1981		5.65		(1.06)
1982		9.63		(1.25)
1983		7.56		(0.85)
R ² :	0.98			
F Value:	1375.5			

For each day of care provided, before DRG the hospital would use 17 hours of employee time and about 40 minutes of physician time. Following the switch to DRG, this dropped to 16.27 hours of employee time and .72 hours of physicians. Thus a day of care entailed about 45 minutes less nursing and other employee care and about five minutes more physician care. Nevertheless, there appears to be strong evidence of a trend over time to add other employees, and some weak evidence of increases in beds and decreases in physician hours.

Perhaps not surprisingly, teaching hospitals were high demanders of all three inputs, even after controlling for the days of care provided. Both inner city and rural hospitals also appear to use more physician hours than do suburban hospitals. In rural areas, low occupancy may be forcing these hospitals to carry a greater overhead in doctors than is necessary. It is not clear why inner city hospitals use more doctors, though perhaps more severely ill patients may require greater doctor intensity than elsewhere.

In summary, we estimated several regression equations to determine how a hospital's use of labor and other inputs may have changed in response to the financial incentives of the DRG program. Our regressions revealed some economizing by hospitals in the use of both physician and non-physician labor and virtually no effect on the demand for capital (beds) in response to the DRG program. These results are consistent with the incentives of the program. Under the New Jersey system, savings which a hospital might realize from using less labor or materials could be retained by the hospital as an operating profit. However, hospitals had weak incentives to forgo construction or other capital investments because interest costs associated with these activities were reimbursed by the program. Consequently, we see no evidence in our regressions of savings in the use of capital.

Whether these attempts at economizing on the use of inputs had any effect on the quality of care is an issue which is explored in the following section.

3.5.2 Quality of Care

New Jersey's rate setting program was designed to encourage greater economy in operations among New Jersey hospitals. Economizing efforts may promote more careful use of inputs and cause a general increase in efficiency without adversely affecting--perhaps possibly improving--the quality of patient care. There is also, however, a danger that the quality of care may deteriorate if the use of inputs is too severely constrained by the rate setting process.

To examine the effects of New Jersey's DRG program upon the quality of care, this project conducted an intensive case study in New Jersey to learn about the perceptions of health care providers, state officials, and consumer groups regarding changes in quality which they believe may have occurred as a result of the DRG program. From this vantage point, we found some concerns about the potential of a DRG system to have an adverse impact, but we found no hard evidence or consistent perception of quality deterioration. (Koetting, Korda, and Olinger, 1985)

In addition to the case study work, we have had the opportunity to review data and analyses which are now also being completed for HCFA by Abt Associates under the National Hospital Rate Setting Study (NHRSS). We will briefly describe here the methodology of that study and its relationship to our evaluation of the DRG system in New Jersey. We will also present some preliminary statistics developed by the NHRSS comparing New Jersey with other states. The preliminary statistics and analyses developed by the present

study do not reveal any adverse effect. Final data analysis by the NHRSS project is still in progress.

The NHRSS is concerned with determining the impact of hospital prospective reimbursement (PR) programs. These programs have the common feature that they pay a hospital at a rate which is fixed in advance of the delivery of care. The New Jersey DRG program is one example of a PR program; in other states the payment rate may be fixed on the basis of a day of care, or an admission without necessarily taking into account the diagnostic classification system used by the New Jersey program.

Examination of the quality of care in the NHRSS focuses on the dimensions of structure, process and outcome suggested by Donabedian (1973, 1978). Structure refers to the volume and quality of resources brought to bear on patient care; process refers to the appropriateness of medical management decisions; outcomes for patients refer to the extent to which care improves the health status of patients. The NHRSS therefore attempts to measure the effect of the New Jersey DRG program using indicators of these three dimensions.

Research to date suggests that there may be little potential for detecting adverse effects of rate setting programs across all patients simply because of the complexity of the health care process. As a result, to detect adverse affects, the researcher must focus on areas of care where rate setting is most likely to have had an impact on the allocation of resources in a manner which might affect patient health status.

For this reason, the NHRSS has used panels of physicians and administrators to identify "care sensitive" conditions -- conditions felt to be especially sensitive to hospital administrative and policy actions and

therefore especially sensitive to the effects of rate setting. The process of selecting care sensitive conditions involved:

1. determining avenues of administrative response to rate setting most likely to affect the process of care;
2. determining which principal diagnoses and procedures are most reliant on aspects of the care process involving significant administrative discretion;
3. ranking care sensitive diagnoses and procedures according to the likelihood of serious adverse outcomes stemming from deficiencies in aspects of care under administrative control.

This ordering was used to identify 76 care sensitive classes of cases which in turn were aggregated into 59 "urgent care" diagnoses, and 8 "elective surgical procedures". By tracking mortality rates in these categories, it is likely that any adverse impacts of a reimbursement system upon patient outcomes in care sensitive areas of hospital care can be detected.

The relationship of prospective reimbursement to changes in quality is complicated by the need to control for changes in casemix which may occur for reasons having nothing to do with reimbursement incentives. The NHRSS approach to controlling for casemix changes has been to standardize actual mortality rates to take account of the number of deaths that might be expected for a given admission in a particular group. Specifically, for each admission, average "expected" mortality rates were computed for the diagnostic/procedure involved, sex, and the age group (3 groups) of the patient. The ratio of actual mortality to this expected mortality thus serves as a standardized measure which takes account of casemix.

The NHRSS sampled data from U.S. hospitals. The hospital sample consisted of: 1) all hospitals in the 15 prospective reimbursement states with median length of stay of 15 days or less and; 2) a 25 percent random sample of all hospitals in the continental United States, outside the 15 PR states, with

median length of stay of 15 days or less. Within the sampled hospitals, the NHRSS collected data on patient mortality from HCFA's 20 percent MEDPAR file. This file contains data on each hospital stay for all Medicare beneficiaries having social security numbers ending in 0 or 5. The MEDPAR data set includes basic demographics (age,sex,race), principle diagnosis or procedure, days of care, status at discharge (dead or alive), as well as other information on length of stay and resource utilization.

One problem faced by the NHRSS is that some PR programs, such as the New Jersey DRG system, encourage changes in the way that diagnostic information is reported. For example, reimbursement in New Jersey is affected by the diagnosis and one might expect hospitals to pay more careful attention to collecting diagnostic information than in the period before DRG's. Also, one might expect hospitals to be sensitive to reimbursement considerations when coding a diagnosis and to allow themselves the benefit of a higher reimbursement code in any case where there is ambiguity in how a patient might be classified. This factor would cause an "upgrading" of diagnoses in New Jersey after the introduction of the DRG program and this in turn would tend to bias the calculated "expected outcome" upward (by increasing the percentage of the more severe cases among all cases). In the NHRSS, where quality indicators are normalized by expected outcome, the effect would be to bias downward estimates of the effect of the DRG program on each quality indicator. That is, death rates would appear to fall in the more serious diagnostic categories because the count of cases is being diluted by an influx of cases that would once have been classified as less serious.

The NHRSS methodology partly corrects for this problem by elaborate statistical modeling (still in progress at this writing) and by judging results at confidence levels which are more concerned with avoiding Type II

error. Consequently, caution should be exercised in judging outcomes in New Jersey using only the preliminary NHRSS standardized mortality data available to this report. Table 3.18 reports standardized mortality rates for New Jersey compared to the 36 non-PR control states for the period from 1974 to 1983. The rates are computed as the actual mortality rate divided by the expected mortality rate times 100; that is, they represent the percentage by which the actual rate differs from the expected. The rates are reported for all diagnoses, urgent care diagnoses, and elective surgery.

The most notable finding in these tables is that mortality rates have been generally declining over time in both New Jersey and the control states. This trend reflects general improvements in public health and medical technology. From inspection of the data, New Jersey seems to have slightly higher standardized mortality rates in terms of all diagnoses, elective surgery and all urgent care than did the control states in the period before the introduction of DRG reimbursement. After the introduction of DRG's in 1980, there appears to be a slight decline in the standardized mortality rates for all diagnoses compared to New Jersey's rates for previous years. However, the state appears to have remained above the experience of the control group. For all urgent care, New Jersey seems to have no trend relative to the period before DRG's although once again, the state's standardized mortality rates appear to be slightly higher than in the control states. For elective surgery, inspection of the data show a mixed pattern for New Jersey relative to the control states.

To determine if these apparent differences in mortality rates were statistically significant, we undertook regression analyses for each mortality category. Table 3.19 reports the results of these analyses. The standardized mortality rates were regressed on 1) a dummy variable for New Jersey (1=

Table 3.18

Standardized Mortality Rates for New Jersey versus 36 Control
States not Subject to Hospital Prospective Payment 1974-1983

Year	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
All Diagnoses										
NJ	119	118	106	98	103	110	109	103	105	104
Control	108	103	100	95	93	103	100	101	96	97
Elective Surgery										
NJ	105	106	111	108	64	96	118	87	95	72
Control	102	97	120	96	88	110	113	94	95	90
Urgent Care										
NJ	124	103	103	98	101	107	104	103	104	103
Control	109	106	104	95	92	105	103	99	97	100

SOURCE: Authors' Computations from National Hospital Rate Setting Study Data

Table 3.19

Regressions of Standardized Mortality Rates,
New Jersey versus Control States 1974, 1983

<u>Variable</u>	<u>All Diagnoses</u>		<u>Urgent Care</u>		<u>Elective Surgery</u>	
	<u>Coefficient</u>	<u>T</u>	<u>Coefficient</u>	<u>T</u>	<u>Coefficient</u>	<u>T</u>
Constant	185.202	4.691***	186.976	4.111***	281.050	2.637**
NJ Dummy	7.219	2.539**	2.810	0.858	-6.767	-0.882
DRG Dummy	1.702	0.409	2.976	0.620	6.167	0.548
Year	-1.090	-2.170**	-1.095	-1.892*	-2.300	-1.695*
\bar{R}^2 :		.437		.147		.036
STANDARD ERROR OF ESTIMATE:		5.150		5.932		13.902

***Statistically significant at the 99% level of confidence.

**Statistically significant at the 95% level of confidence.

*Statistically significant at the 90% level of confidence.

New Jersey, 0 = Control state), 2) a dummy variable for New Jersey in the years after the implementation of the DRG program (1=post DRG, 0= pre DRG) and 3) a time variable(74...83). No significant differences were found in New Jersey for the periods before and after the implementation of the DRG program. The regressions confirmed that over time there was a statistically significant decline in mortality (at at least the 90 percent level of confidence) in both New Jersey and the control states over the period from 1974 to 1983. This was true for all diagnoses, urgent care diagnoses, and elective surgery. In the regression for all diagnoses, the dummy variable for New Jersey is positive in sign and statistically significant at the 98% level of confidence. This confirms our impression from Table 3.18 that New Jersey has historically had a higher mortality rate than the control states. In the regressions for urgent care and elective surgery there is no evidence that New Jersey differs from the control states. None of the regressions showed any significant differences in mortality in New Jersey after the implementation of DRG compared to the pre-DRG period.

Our analysis therefore does not reveal any adverse impact of the DRG program on the quality of care in New Jersey where quality of care is measured in terms of standardized mortality outcomes in categories of service where budget constraints might have been expected to affect patient care. Our analysis was restricted to a comparison of New Jersey versus 36 other states that were not subject to hospital prospective rate setting programs. The analysis is based upon data aggregated at the level of the state of New Jersey and the other 36 states. Our results should be interpreted cautiously due to the high level of aggregation in the data. A more refined analysis of this issue is currently being undertaken by the NHRSS. The NHRSS methodology will work with hospital level data and it will accordingly be able to control more

rigorously for characteristics of individual hospitals. The final assessment on the effect of the New Jersey DRG program on quality of care outcomes consequently remains to be completed by this other HCFA sponsored project.

3.6 Changes in Medicaid's Share of Hospital Revenues

In this section we examine the effect of the DRG payment system on the relative importance of Medicaid as a contributor to hospital utilization and revenues.

Table 3.20 presents data on total Medicaid percentages of care and percentages of hospital costs, charges and revenues. For comparative purposes, the figures are taken from two different data sources, the SHARE files and the payer summary files, and they show similar results. Given the decline in Medicaid beneficiaries during the period of study, it is not surprising to see the Medicaid program represent a decreasing share of hospital revenues in New Jersey. As can be seen, both Medicaid admissions and patient days are a larger percentage of hospital activity than are the hospital cost or revenues. As was seen during the discussion of casemix, this table shows that the Medicaid program has and continues to pay less per admission than does the general hospital population. The Medicaid share of patient days is similar to the share of revenues and charges, reinforcing earlier evidence that Medicaid savings come from a shorter length of stay.

A further illustration of the effect of the DRG program on payments for uncompensated care is Table 3.21 which presents the average level of uncompensated care by class of hospital during the periods before and after the commencement of the program. The table shows that teaching and city hospitals which have the highest Medicaid patient loads had the largest increases in uncompensated care. Moreover, it appears that county and

Table 3.20

Comparison of New Jersey Payer Summary Files and SHARE Files
As Sources of Data for Medicaid Inpatient Statistics, 1979 and 1983

PAYER SUMMARY FILES

	<u>1979</u>	<u>1983</u>
Medicaid Percent of Inpatient Admissions	11.4%	10.0%
Medicaid Percent of Inpatient Patient Days	9.2%	7.8%
Medicaid Percent of Inpatient Total Costs	8.8%	NA
Medicaid Percent of Inpatient Hospital Charges	NA	7.6%

SHARE FILES

	<u>PRE-DRG</u>	<u>POST-DRG</u>
Medicaid Percent of Admissions 9.9%	9.5%	
Medicaid Percent of Patient Days	7.6%	6.8%
Medicaid Percent of Inpatient Revenues	7.7%	6.8%
Medicaid Percent of Outpatient Revenues	12.3%	11.8%
Medicaid Percent of Total Revenues	8.1%	7.5%

NA = Not available

Table 3.21

Average Uncompensated Care By Class of Hospital
Before and During DRGs

	Charity Care	Bad Debts	Grants for Indigency			Total* Uncompensated Care
			County	Municipal	Other	
<u>Teaching Status</u>						
Major Teaching						
Before DRGs	1074	1519	-43	-4	-14	2283
During DRGs	2047	3424	-10	-13	0	5053
Some Teaching						
Before DRGs	1049	1089	-94	-32	0	2013
During DRGs	1232	2135	-0	-12	0	3356
Non-Teaching						
Before DRGs	293	618	-35	-8	-1	729
During DRGs	546	1257	-21	-0	-2	1664
<u>Hospital Location</u>						
Inner City						
Before DRGs	875	1364	-49	-18	0	2124
During DRGs	1587	2796	-0	-11	0	4040
Urban						
Before DRGs	956	1113	-49	-17	0	1701
During DRGs	1072	2688	0	-7	-1	3644
Suburban						
Before DRGs	417	685	-50	-4	-11	841
During DRGs	879	1374	-39	-1	-2	1993
Rural						
Before DRGs	155	451	-25	-2	-1	524
During DRGs	496	658	-6	-1	0	1146

*Total may not sum to equal the detail due to missing data.

municipal governments took advantage of the DRG provisions to reduce their contributions to indigent care. The inclusion of uncompensated care in the Medicaid DRG rates thus allowed some shifting of the uncompensated care burden from local government onto the federal tax system.

3.7 Conclusions

There have been a number of changes in the operation of the New Jersey Medicaid program and the operations of New Jersey hospitals during the period of transition from the older, per diem form of Medicaid reimbursement to the DRG system of reimbursement. Some changes occurred coincidentally with, rather than because of, the DRG system, but a summary of the important changes includes:

- The Medicaid program sharply reduced its size during these years in terms of the numbers of persons eligible for services. This change was coincidental with the initiation of the DRG program but directly attributable to OBRA provisions
- Casemix for Medicaid patients changed along with changes in population eligibility. However, the net effect of the casemix changes was essentially neutral with respect to relative costliness since decreases in eligibility applied in roughly equal proportions to all medical conditions.
- Casemix for Medicaid patients is more concentrated in a few DRGs than for the general population.
- With the advent of DRGs, hospitals may have made some attempts to avoid treating cases where their reimbursement was below their cost. However, hospitals had only weak success at changing their casemix for all payers and essentially no success at changing casemix for Medicaid.
- The New Jersey DRG system encouraged hospitals to become more capital intensive, since the system allowed for reimbursement of capital costs outside of the limitations of the DRG payments.
- The DRG program encouraged hospitals to economize on the treatment of individual cases but to exploit the system

by increasing admissions. Under the DRG program, New Jersey Medicaid experienced reductions in expenditures, expenditures per admission, and length of stay of about 7 percent, 17 percent, and 15 percent, respectively. Admissions, however, increased by almost 16 percent in spite of a drop of 12 percent in the Medicaid eligible population.

- Hospital mortality rates in categories that were likely to be affected by the DRG reimbursement program were examined for evidence of ill effects. It appears that mortality generally declined in New Jersey during the DRG era in keeping with long run national trends. New Jersey's hospital mortality rates also appear to be somewhat higher than the national experience and this gap may have worsened in the DRG period. Statistical analyses by this project failed to show any statistically significant effects on mortality by the DRG program; however, a fuller analysis of this issue is being completed for HCFA by the National Hospital Rate Setting Study.

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CHAPTER 4

CONCLUSION: SELECTIVE CONTRACTING, DRGs, AND THE FUTURE

The 1980s have witnessed major innovations in how state Medicaid programs reimburse for inpatient hospital care. The federal government encouraged these innovations: in 1981, OBRA provisions removed the general requirement that Medicaid programs use Medicare cost-based reimbursement principles, and authorized Medicaid programs to obtain special waivers to limit beneficiaries' freedom of choice. The provisions of TEFRA in 1982 and Medicare's Prospective Payment System (PPS) in 1983 accelerated state changes allowed under OBRA, by providing models for the direction and shape of reimbursement system design. By late 1985, all but eight states had in fact changed their reimbursement systems, most states opting for some form of prospective reimbursement. The outcomes of these state changes vary, of course. If there is an overall message from these varied state experiences, however, it is that:

- prospective payment methods have generally reduced the growth in Medicaid inpatient hospital expenditures.
- this overall reduction in the growth of Medicaid expenditures was not accompanied by the severe side effects many feared, such as a serious deterioration in the quality of or access to inpatient care.

This message certainly constitutes a positive appraisal of the innovative efforts that the federal government encouraged and the states implemented. Federal and state efforts in so complicated an area rarely yield results that so closely approximate intent.

Perhaps the most revealing lessons, however, are to be found in the details of state-by-state experiences, not in the generalities of the overall appraisal. In keeping with the federalist impulse, states adapted broad

federal goals to their individual circumstances, providing experiments of a sort that, in their variation, reveal some of the key difficulties and opportunities that states faced. One part of the Medicaid Hospital Reimbursement Project was devoted to detailed studies of reimbursement innovation in particular states. As discussed in preceding chapters, the project evaluated the implementation of selective contracting in California and Illinois and the implementation of DRG-based reimbursement in New Jersey and Pennsylvania. In addition, for the two states for which sufficient data were available--California and New Jersey--the project performed a series of data analyses to assess the impacts of the new reimbursement systems.

These states each made very different choices about their roles as purchasers and regulators of inpatient hospital care. Apart from their surface similarity in choosing new, prospective reimbursement systems, these states demonstrated very different concerns about what their reimbursement innovations should accomplish and used very different means to address those concerns. Having discussed the empirical results of these state studies in earlier chapters, we will focus in this concluding chapter on the implications of the different choices these states made. Most of the discussion will be devoted to the results in California and New Jersey. The context for this discussion can best be established by reviewing, first, the results of the data analyses for those two states.

4.1 Summary of the Empirical Results

Previous chapters have presented and discussed the results of data analyses for California and New Jersey. The results of these analyses are summarized in Table 4.1. These results must be interpreted with some caution. The most important problem is that the numerical results for the two

Table 4.1

California Versus New Jersey:
Summary of Selected Empirical Results
(Percentage Change in Medicaid Results Only--Other Payers Excluded, except as noted)

	California: Selective Contracting (1984 vs. 1983)	New Jersey: DRGs (1983 vs. 1979)
1. Predictors of Hospital Participation	<ul style="list-style-type: none"> --Best predictor of winning bidders: percent of historical Medi-Cal involvement --Low percentage of hospital occupancy <u>not</u> a predictor 	--Not applicable--all payer system for all hospitals in the state
2. Casemix Change	<ul style="list-style-type: none"> --No material change overall --Contract hospitals: no material change --Non-contract hospitals: 16% increase in average weighted cost of treatment (larger proportion of "emergency cases") 	<ul style="list-style-type: none"> --No material change overall --No material shift to more "profitable" DRGs--little change in "internal" or "external" market share
3. Utilization	<ul style="list-style-type: none"> --Overall <ul style="list-style-type: none"> • Admissions +5% • Patient days +4% • Length of stay -2% --Contract hospitals: increases in admissions (13%) and days (11%), decrease in average LOS (-4%) 	<ul style="list-style-type: none"> --From sample of hospitals (Table 3.4) <ul style="list-style-type: none"> • Admissions +16% • Patient days -4% • Length of stay -15%
4. Medicaid Inpatient Expenditures a. \$/day b. \$/admission c. Total expenditures d. Comments	<p>Over all hospitals, 1984 vs. 1983, comparison in real terms:</p> <ul style="list-style-type: none"> • -19% • -21% • -16% • California's aggregate contract expenditures remained flat after 1984. 	<p>Over all hospitals, 1983 vs. 1979, comparison in real terms:</p> <ul style="list-style-type: none"> • -4% • -17% • -7% • If number of eligibles had not decreased, total expenditures would have <u>increased</u> 6%
5. Outpatient Substitution	<ul style="list-style-type: none"> • OP visits (contract hospitals only): +15% • OP visits per inpatient admission: -0.5%* • Ratio virtually unchanged because admissions in contract hospitals increased roughly the same amount as visits. 	<ul style="list-style-type: none"> • OP visits: +8% • OP visits per inpatient admission: -11% • Ratio declined mainly because admissions increased 16%, while visits increased only 8%
6. Quality of Care a. Interview data b. 30-day mortality rates	<ul style="list-style-type: none"> • No indication of problem • No significant change at 90% confidence level. 	<ul style="list-style-type: none"> • No indication of problem • Using standardized mortality data, no significant change at 90% confidence level.
7. Effect on Hospital Operations/Finances	<ul style="list-style-type: none"> • Some evidence that contract hospitals experienced an overall increase in debt. • Weak evidence of adverse effect on operating margins and ratio of current assets to current liabilities in contract hospitals. 	<ul style="list-style-type: none"> • Evidence of increase in average debt load for all hospitals. • Strong evidence of increase in capital spending, with larger rate effects for hospitals with larger Medicaid loads. • Some economizing in use of physician and non-physician labor. • Increase in percentage of uncompensated care costs

*Reciprocal of change in ratio of admissions/visit in Table 2.7.

states cannot be directly compared, since the analyses cover different time periods (1984 versus 1983 for California; and 1983 versus 1979 for New Jersey). Thus, for example, in comparing the results on utilization in the two states (see Table 4.1), New Jersey's 15 percent reduction in length of stay occurred over a period of four years, while California's 2 percent reduction occurred over one year. There is a temptation to annualize the New Jersey reduction--that is, to calculate a hypothetical, average annual reduction that would cumulate to the observed four-year reduction--to obtain a number for simple comparison to the California utilization reduction figure. However, any such annualization would distort the New Jersey results, since, among other things, the number of hospitals being reimbursed through DRGs is different in each of the four years. (Indeed, in the New Jersey data analyses, 1983 results are compared to 1979 results because 1979 is the last full year before DRG implementation began, while 1983 is the first full year after DRGs were fully implemented for all hospitals).

If numerical results for the two states cannot be directly compared to each other, they can be used to characterize the direction of change in each state over the respective time periods of the analyses. Viewed in these terms, the principal findings summarized in Table 4.1 are:

- Both states achieved reductions in cost per day and cost per admission for Medicaid inpatients.
- Total inpatient expenditures declined in real terms in both states, but expenditures would in fact have increased in New Jersey if the number of eligibles had not declined.
- In achieving these financial results, both states experienced:
 - little overall change in the composition of hospital inpatient casemix,

- no sign of substantial substitution of charge-based outpatient care for inpatient care,
- little statistical or anecdotal evidence of a deterioration in the quality of care, and
- little evidence of a deterioration in the financial condition of hospitals generally eligible to serve Medicaid patients, beyond a slightly larger debt load.

These results accurately reflect the different objectives of reimbursement innovations in the two states. California pursued a change in its reimbursement methods amidst a fiscal crisis that demanded savings. New Jersey was reacting to a different kind of crisis: the financial distress of inner-city hospitals serving large Medicaid populations (and, to a lesser degree, the payer inequities of the existing SHARE reimbursement system). Under SHARE, New Jersey had achieved some control over the growth in Medicaid inpatient expenditures--its DRG program was designed among other things to relieve the distress that the SHARE program had caused, in particular to inner-city hospitals. California had not been so successful in controlling hospital costs, faced large budget deficits, and required substantial, immediate savings from its new selective contracting program.

There is some risk of confusing the results in the two states with the different general approaches the two states used--regulated DRGs in one, selective contracting for per diems in the other. While these methods were indeed well suited to the objectives each state held, they were not the only possible methods to have been used; and their particular selection imported a set of advantages and disadvantages to the states' efforts. The balance of this chapter will review what these advantages and disadvantages were and speculate on the implications of the reimbursement innovations in these two states.

4.2 Comparing Selective Contracting and DRG Systems

The implementation of any new reimbursement system requires a complex series of choices. Selective contracting and DRGs can be concretely compared in terms of how states have made some of the most important choices, and with what results. These choices include: the balance between centralized regulation versus decentralized negotiation in the administration of a reimbursement system; the measures taken to monitor and to mitigate the potential disincentives of the unit of reimbursement; the stringency of reimbursement levels; the control of capital costs; and the ways to fund care for the indigent population. Each of these choices is discussed below, with a focus generally on the contrast between California and New Jersey..

4.2.1 Negotiations versus Regulation

Selective contracting and DRGs are not mutually exclusive: in principle, a state could enter contract negotiations to establish DRG rates.¹ California, for example, chose to maintain the per diem structure of its previous retrospective pricing methodology when it implemented contracting. State officials felt that the establishment of a DRG framework for the price negotiations would be too time consuming to design and implement. It was enough simply to get a novel selective contracting process in place, using a conventional unit of reimbursement, without taking on the additional burden of

¹In the autumn of 1987, the State of Washington began a process of selective contracting for Medicaid which also involves the use of DRGs. Hospitals are being asked to submit bids in two aggregated DRG categories: Maternity Admissions and All Other Diagnoses. The state will select winners (possibly all hospitals, depending on the prices bid) and contract with them for Medicaid services. This is a modification of a full DRG system since hospitals have to take account of their own anticipated casemix and factor this into the aggregated DRG rates which they quote. The state is asking for bids which will obligate the hospital for one year; at what point rates will be renegotiated remains undetermined at this writing.

a relatively novel DRG unit of reimbursement. The combination of DRGs and contracting is, however, a potentially interesting one, as the administrative advantages now demonstrated by selective contracting may be uniquely suited to the heavy administrative demands of a DRG methodology.

Consider the administrative advantages enjoyed by California (and Illinois) in selective contracting. The implementation of selective contracting did not require a large expenditure of new administrative money: only \$1-\$2 million in each state. It did not require much time: a little over a year in each state from the passage of authorizing legislation to the actual conduct of inpatient reimbursement under the new contract regime. Meanwhile, providers seemed relatively satisfied--if not delighted--with the selective contracting process, particularly in view of the inflexible rate-setting most providers imagined as the likely alternative to contracting. One sign of provider acquiescence: in California and Illinois, only one lawsuit was brought against either program as it was being implemented (that in California, by a hospital that wanted to obtain a contract).

Providers may be satisfied with contracting because contracting provides flexibility that cannot easily be established through centralized, formulaic rate-setting schemes. In negotiations, the state can adjust the terms of reimbursement ad hoc to the individual circumstances of each hospital. Such fine-tuning can be difficult to accomplish through regulations and formulae that are applied with little case-by-case discretion. Meanwhile, hospitals can voluntarily opt out of a selective contracting program: while they are no longer entitled to be reimbursed by Medicaid, they are not required to participate in the program (except under emergency circumstances). Selective contracting can thus provide a safety valve for hospitals that do not want to participate in the program. And contracting does so in a

way that--compared to centralized rate-setting--reduces information demands on the state. To be an effective negotiator, of course, the state must come to the negotiating table well-informed. (Both Illinois and California recognized this need, as both states established special legislative provisions to gather data from hospitals and to protect the confidentiality of the negotiations.) But contracting reduces the information burden on the state, in that the state need not devise a centralized methodology or formula that formally accommodates all the variation in hospitals and patients; and the state can, to some degree, use the apparent competition in the contracting process to elicit information about feasible prices for hospitals.

These strengths of selective contracting stand in marked contrast to the DRG approach, implemented as it has been through centralized regulation. In New Jersey, extended efforts have been required to fine-tune reimbursement formulae, based on standardized information the hospitals are required to produce annually. Superficially, selective contracting would seem an ideal solution to the heavy administrative demands of DRGs--why not let competitive pressures elicit information about each hospital's most efficient costs for each DRG (or selected DRGs)? Selective contracting would shift the burden of proof, and ease the information and due process requirements, in finding a comprehensive formula to cover all circumstances. The solution seems natural, in principle.

However, there is one practical reason that California- or Illinois-style selective contracting could not be applied in New Jersey: a straightforward contracting process would not work to set rates for all payers. For selective contracting to work in California and Illinois, these states had to be selective: they had to have the power to exclude hospitals. Otherwise, the competitive pressures on which the California and Illinois programs relied

would disappear. Unfortunately, when a state seeks to establish rates for all payers, the state cannot plausibly exclude hospitals: exclusion from an all-payer system would force a hospital to close. That threat is too draconian to be credible. Any state attempting, like New Jersey, to establish rates for all payers must solve some fairly difficult design problems for the contracting system actually to work in an all-payer setting.²

Rather than attempting to devise a system to permit the state to negotiate for all payers, the state could take an alternative approach: empower all payers to negotiate for themselves. It would be feasible for each payer separately to ask for bids (at different times) and separately to select the set of hospitals with which that payer wishes to contract. Separate negotiations imply that a hospital might win a contract with one payer, lose a contract with another, etc., so that all hospitals would have a reasonable chance of winning at least some business with some payer(s). There is some question whether Medicare would ever participate in such a process; that issue aside, such a process would yield contract rates for virtually all payers. Indeed, California had an approach like this in mind, when the legislation granting the state the authority to contract selectively also granted similar powers to other payers. It is worth emphasizing, however, that this approach does not necessarily yield a simple proxy for the New Jersey all-payer

²A solution to these design problems would require devising a system to penalize, rather than exclude, hospitals that submit high bids. For an example of how such a system might work in one market--the market for clinical laboratory services--see Stephen T. Mennemeyer et al., Demonstration and Evaluation of Competitive Bidding as a Method of Purchasing Clinical Laboratory Services: Demonstration Design Report, Abt Associates Inc., Cambridge, MA, Health Care Financing Administration Contract No. 500-85-0052, February 1987, Ch. 2. The important point to note here is simply that a sophisticated form of contracting may be feasible in an all payer system--the difficulties are not insoluble, although the solutions are as yet untested.

system. Apart from any question about Medicare's participation, variations among payers and hospitals in bargaining power and skill may yield a wide dispersion of potential reimbursement outcomes. A state that desires equity among payers and hospitals to be determined on grounds other than bargaining power and skill will be forced actually to set or negotiate the rates in some fashion for all payers.

However, for states implementing DRGs for a few or, certainly, one payer, this structural difficulty should not exist. Selective contracting could prove to be a remedy for the kind of administrative difficulties New Jersey and other states have confronted with DRGs.

4.2.2 The Unit of Reimbursement

California and New Jersey represent not only different administrative strategies--contracting versus centralized formulas. They also offer contrasting rate structures with different sensitivities to casemix differences. California opted for reimbursement based on (usually) a single per diem per hospital; regardless of a particular patient's diagnosis or cost of treatment, the hospital would receive the negotiated per diem for as many days as the patient remained in the hospital. Here, payment was essentially insensitive to casemix. In New Jersey, DRGs provided an established payment for each diagnosis, regardless of the patient's cost of treatment or length of stay. The New Jersey approach was highly sensitive to casemix. Each rate structure offers hospitals a different set of nominal incentives. Per diems provide hospitals an incentive to avoid difficult cases (whose cost may exceed the per diem), and to prolong lengths of stay so long as the per diem is greater than marginal cost. DRGs encourage hospitals to increase their admissions, to avoid unprofitable DRGs, to avoid especially costly cases

within DRGs that are otherwise profitable, and to discharge patients earlier than might in fact be appropriate for the patient. Like all prospective systems, both DRGs and per diems encourage hospitals to reduce the costs of treatment--and potentially to reduce quality of care--in that hospitals can always make more money by treating patients in a less costly way.

Thus, although these prospective rate structures might give hospitals more reasons to economize than retrospective structures, they also contain new disincentives of their own that are a product of the units of reimbursement. Both California and New Jersey adopted or already had in place administrative and financial measures to combat these disincentives. In New Jersey, charge-based treatment of outliers served to reduce the incentive to avoid complex cases. In both states, utilization review took on major importance. In California, that state's notably stringent UR program held lengths of stay below the average that existed before the contracting program (see Table 4.1). In New Jersey, increased admissions, not lengths of stay, were the potential problem. New Jersey in fact has experienced a substantial (16%) increase in admissions, notwithstanding the decline in Medicaid eligibles. Of course, the growth in admissions is not necessarily due to DRGs alone, and there is no hard evidence that more stringent UR could have prevented the increase. But the suspicion that DRGs encouraged this increase and better UR could have prevented it is inevitable.³

In other important respects, the potential disincentive effects of the units of reimbursement were absent. For whatever reason, there is no evidence that California or New Jersey hospitals diverted "hard" cases, or that they

³UR is important in New Jersey as well for policing the diagnosis groups to which patients are assigned and, more generally, to oversee utilization for the one-third of all cases deemed "outliers" in the New Jersey system.

sought--successfully at least--to expand their share of "easy" cases. At the same time, while the measures are necessarily crude (e.g., 30-day mortality rates), there is no evidence that hospitals in either state reduced the quality of care they delivered to these patients.

The incentives of the units of reimbursement appear overall to have had only some of the practical effects that were feared. In California, a well-developed UR capability apparently was able to prevent the feared increase in length of stay. In New Jersey, at least one of the feared outcomes--increased admissions--did occur, but there were otherwise few negative results.

4.2.3 The Number of Payers and the Stringency of Rates

New Jersey's success at controlling costs appears limited by comparison to California's experience. California enjoyed substantial immediate savings with contracting that have endured as aggregate contract expenditures remained flat after the first year. New Jersey, by contrast, enjoyed a modest decline in Medicaid inpatient expenditures in the first years of DRGs, but that decline would have been a modest increase if the number of eligibles had not fortuitously decreased. The rebasing of DRG rates in 1984 may have yielded a substantial increase in expenditures.

This comparison of growth rates does not tell the whole story: among other things, New Jersey entered the 1980s below the national average in the level of its inpatient hospital costs per Medicaid recipient, while California began the 1980s above the national average (Cromwell and Hurdle, 1986, Table C-2). Be that as it may, New Jersey's program cannot easily claim to have contained costs. There are two apparent reasons for New Jersey's lesser success, and neither has anything to do with DRGs as such:

1. The burden of an all-payer system--In an all-payer system, the Medicaid "buyer" cannot use its market power to extract favorable rates that discriminate in its favor. Thus, unlike the Medi-Cal program, the New Jersey Medicaid program was forced to a (higher) common denominator with all other payers in the system. However one views that result, the constraint of the all-payer system that produced it cannot be ignored. The contrast between New Jersey's experience and California's underscores the importance of a state's decision of which payers to include in the prospective pricing regime it implements, whether that regime be DRGs or anything else. New Jersey had serious reasons for the all-payer system it instituted: it sought to reduce payer inequities and to improve the finances of those hospitals serving a disproportionate share of payers--like Medicaid--that paid lower rates. Given the choice of an all-payer system, New Jersey's Medicaid savings were bound to be lower than might otherwise have been possible.
2. Stringency of rates--In a state implementing selective contracting, the state has discretion (not absolute) about the level of rates it will accept. It can be generous or unyielding, like any negotiating partner. In implementing DRGs, a state can establish stringent formulae with few hospital-specific components and an extensive set of unbending external standards of efficiency; or the state can be accommodating with minute attention to hospital-specific variations. In general, then, a state can choose to be tough or relatively generous, whatever its rate-setting methodology and whatever the process--contracting or regulation--used to implement that methodology. The choice that a state makes on how tough it will be may have a greater impact on hospitals than any other detail of the reimbursement process. Generous rates, however structured, may accommodate the routine behavior of hospitals; stringent rates could coerce radical changes.

It is obvious that New Jersey chose to be generous--indeed, a major premise of the entire DRG venture was the need to alleviate the financial distress of (inner-city) hospitals with large proportions of Medicaid patients who were reimbursed at stringent Medicaid rates under the SHARE system. New Jersey's DRG rates thus accommodate hospitals in matters ranging from capital costs and uncompensated care to the charge-based treatment of outliers. These are not the formulae that a state seeking cost savings would have established. California, by contrast, required immediate budget savings. Negotiators dramatized the point by rejecting early bids of certain major Medi-Cal providers. California has

retained that stringency, and the savings that resulted have been substantial.⁴

The different levels of stringency employed by California and New Jersey emphasize that rate setting innovation is not only a matter of summary abstractions like the unit of reimbursement or the administrative method of implementation. The financial results of rate-setting innovation may depend most of all on less conspicuous matters, like how stringent the state chooses to be and how much it links Medicaid to the fortunes of other payers.

4.2.4 The Control of Capital Costs

Reimbursement schemes are only one part of the larger process that determines the cost of providing hospital services. That larger process will not spontaneously mesh with a reimbursement scheme--certainly not with a new reimbursement scheme. States must have a clear idea how the various parts of the larger process are to fit together to achieve the desired allocation of risk. Failure to do so serves to undermine whatever the nominal incentives that the reimbursement scheme, standing alone, is thought to establish.

The difficulty is epitomized by the problem in New Jersey of coordinating DRG rate setting with capital spending by hospitals. In New Jersey, the Certificate of Need (CON) process limits capital investment by hospitals. The underlying premise is that the rate setting system will inevitably

⁴Note also the experience in Pennsylvania: when that state implemented DRGs, it did so with more serious cost containment goals than New Jersey. Pennsylvania's DRG formulae are accordingly more stringent than New Jersey's and--although the necessary data are not yet available--the prospects for cost savings through DRGs are greater in Pennsylvania than New Jersey. Indeed, New Jersey's accommodating formulae may be unusual among states now using DRGs for Medicaid inpatient reimbursement. On the Pennsylvania experience, see Lois Olinger et al., Medicaid Hospital Reimbursement in Three States: Pennsylvania, Illinois, and Texas, Abt Associates Inc., Cambridge, MA, MPE Paper #3.7, October 1986, Ch. 1.

pay for whatever capital is in place, so capital investments should be reviewed by the state. A pure DRG system, in contrast, embraces the philosophy that hospitals should be free internally to allocate their own resources, but they must live within the revenues awarded by the DRGs. In New Jersey, the basic DRG philosophy was modified to impose no constraints on capital costs, on the grounds that the CON process would oversee the appropriate allocation of capital. However, the CON process, on its part, did little to limit capital investments, acting as if the state's DRG system provided an inherent discipline on capital investments. What results is an ambiguous philosophy of reimbursement: hospitals must live within their rates for the reimbursement of labor and materials, but their major capital investment decisions will be constrained only so far as a process outside rate-setting imposes limits. A more consistent philosophy of reimbursement would require including capital costs in the DRG rate, as a way to provide hospitals clearer incentives for efficient behavior. In any event, better coordination of CON processes with rate-setting goals would help to contain the capital costs embedded in hospital rates.

In California, the problem of controlling capital costs is less serious. As a single payer, Medi-Cal can treat capital costs as exogenous. If all California payers had equal bargaining power and used it, Medi-Cal reimbursement would perhaps be forced closer to hospitals' average, rather than their marginal, costs. Even then, however, the ability of payers to exclude profligate capital spenders (i.e., to exclude expensive hospitals) would help to contain hospital tendencies to consume capital in excess, independent of any CON or other separate state review.

Capital costs are only one example of a more general set of concerns about how rate-setting schemes fit with other federal, state, and private actions that affect hospital costs. (These other concerns include such issues as how compatible the rate-setting scheme is with forms of managed care, like HMOs and PPOs, that the state may wish to encourage; and how compatible the scheme is with the rules and incentives of Medicare.) In general, these problems of fit will be more severe when rate-setting is for all payers--little can be treated as exogenous--and when rates are set by regulation--less can be left to the discipline of competitive pressures. But the generalities should not be carried too far. As discussed below in the final section, the fit between California's single-payer, modestly competitive contracting system may face a severe challenge in how it harmonizes with changes in Medicare's PPS system.

4.2.5 Access and Uncompensated Care

A major issue in any Medicaid rate-setting scheme is the effect of that scheme on indigents' access to medical care. New Jersey, through its inclusion of uncompensated care in the DRG formulae, has guaranteed some degree of access to all hospitals for those not able to afford hospital care.⁵ Generally speaking, California has opted for a very different system, one where the indigent are guaranteed care only at county institutions (since the state has transferred responsibility for the Medically Indigent Adults program to the counties).

California's approach is not a direct function of Medi-Cal contracting, but of the state fiscal crisis that gave rise to contracting. With

⁵Until recently, New Jersey had no program for direct state funding of care for medically indigent adults. The state in effect used DRG rates to fund such a program.

sufficient state resources, coverage for indigents could again be assumed as a state responsibility and could be handled through contracting. This would give the state direct responsibility for the provision of hospital services for this population and could result in the availability of a greater number of hospitals to the indigent. Nevertheless, there is a clear difference in approach between California and New Jersey. California, for all indigents and not just the Medicaid population, has clearly moved away from the concept that the indigent should have the same access to hospital care as any other citizen. This is underscored by the encouragement of non-government contracting--the quid pro quo for Medicaid contracting--which has put pressure on hospitals to divert as much uncompensated care to the county institutions as possible.

The unresolved question in this regard is whether health outcomes for the indigent are affected by where the indigent receive their care. While there may be serious philosophical arguments on either side, the empirical questions are whether the changes in California had negative effects on the health status of indigents and, more generally, whether the health status of indigents is better under the New Jersey approach than the California approach. The research to date on the subject does not provide robust answers.⁶ The answers are important: if health status is not immune to the degree of access to health care, choices that appear fiscally prudent--such as those made in California--may in fact impose heavier costs on indigents than are commonly recognized.

4.3 California, New Jersey and the Future

California and New Jersey have chosen very different approaches to the

⁶See, for example, Lurie et al., "Termination from Medi-Cal--Does It Affect Health?", New England Journal of Medicine, Vol. 311 (August 16, 1984), pp. 480-484.

regulation of health financing. The fact that individual states have the ability to fashion such divergent approaches--and in effect become laboratories for testing alternatives--is testimony to the strength of the federalist system. It is ironic, therefore, that the most severe tests for each of these systems in the coming years will be caused by a national program, Medicare PPS. For each of these states, stresses caused by the Medicare system will largely dictate whether or not the state's approach to Medicaid hospital reimbursement is financially, politically and socially viable.

In New Jersey, the stress will come from the monitoring system included as a condition to the renegotiated waiver. New Jersey's rates are effectively capped at the level dictated by Medicare.⁷ If New Jersey rates creep above the Medicare rates, Medicare will reduce its payments accordingly. Hence, the New Jersey Hospital Rate Setting Commission (HRSC) is under strong pressure to keep its rates below Medicare's.

New Jersey may have some latitude because, with the possible exception of the rise in rates that occurred when DRGs were rebased in 1984, New Jersey's cost control problems have stemmed from the increase in admissions, not the increase in cost per discharge. Since PPS pays on a per case basis, New Jersey could continue to experience aggregate expenditure increases above the national average--due to volume increasing above the national average--but still not violate the terms of the waiver.⁸ Of course, this is true only if Medicare continues to reimburse under its current regulations. If severe steps are taken by Medicare, such as a freeze in Medicare rates combined with

⁷Actually, New Jersey rates are capped at the level of Medicare rates plus the amount of the differential Medicare enjoys, since Medicare pays slightly less than the actual rates determined by New Jersey.

⁸Conversely, New Jersey cannot improve its position vis a vis the waiver by slowing down the rate of Medicare admission growth.

a slow-down in the transition toward national rates, New Jersey could be in trouble.

The stresses created by PPS in California will be entirely different. If the phase-in to national DRG rates continues along its currently proposed course, California hospitals may be under enormous financial pressure because of the differences between California's current costs and national standards. Any further cuts in PPS, such as a freeze in Medicare rates, will make the situation that much more severe for California hospitals. With the average occupancy in the state already under 60 per cent, further cuts could force some hospitals out of business. This will not be surprising to California state officials who, from the beginning of contracting, have predicted that competition would drive some hospitals out of business. Nor is this, in itself, particularly troubling, since California is currently thought to be overbedded. The real questions will be which hospitals are forced out of business and how hospitals which remain in business respond.

Some hospitals are vulnerable precisely because they are not needed. While closure of these hospitals will probably raise political questions in the immediate communities, on balance these hospitals will not be missed. Other hospitals, however, are vulnerable because of their payer mix. Hospitals with large Medicare/Medi-Cal censuses will be in serious trouble. The payer mix of one of the hospitals in our California sample, for instance, was 50 percent Medicare, 25 percent Medi-Cal, 10 to 15 percent uncompensated care, and the balance private payors. Even if this hospital were completely to eliminate its uncompensated care load, it would have no choice but to reduce its costs close to the level of Medicare payments, since the small amount of private payors would barely be able to offset Medi-Cal losses, let alone to

address any additional losses from Medicare.⁹ This hospital, and others like it, would be in serious trouble. The question then becomes whether, after all its competitive rhetoric, the state will be able to stand by if hospitals like this one start to go out of business. It is worth recalling that the financial jeopardy of hospitals such as this one finally tipped the political climate in New Jersey in favor of an all-payer system.

In short, if Medicare continues on its planned course, it will certainly create a test in California of whether a "competitive approach"--which requires that there be losers--is a politically viable way to control hospital costs. At the same time, Medicare could create a test in New Jersey as to whether all-payer regulation, with equality among payers and support for uncompensated care, can continue to satisfy federal requirements.

Thus, at least for the present, it seems likely that the overall direction of cost containment will be dictated more by national Medicare decisions than by forces at the state level. Consequently, it would not be surprising if the states came to identify their role somewhat more in terms of assessing and maintaining the quality of care. An emphasis on quality of care would in part be a defensive move, one potentially effective way for states to oppose cuts in federal contributions to inpatient care. But the purpose would not be merely political or rhetorical: quality of care actually could become a more serious problem, given the success of the revolution in reimbursement. Incentives now restrict, rather than encourage, the provision of additional care. At present, no state--including California and New

⁹The term "losses" is used rather loosely here to describe the difference between average cost and particular rates. Strictly speaking, this is not a loss. But in terms of the present example--where Medicare accounts for 50 per cent of the hospital revenue and can be assumed to provide only average costs--then the difference between average cost and the Medi-Cal contracting rate can be considered a "loss", at least for rhetorical convenience.

Jersey--is able systematically to measure the quality of hospital care, let alone able to regulate it. New Jersey has discussed the monitoring of care more than has California, but has not instituted any specific procedures. A study of the quality impacts of DRGs was originally conceived as one of the major outcomes of the waiver. However, other priorities superceded such a study. New Jersey is again raising this issue, and there is some discussion in DOH of attempting systematically to conceptualize the relationship between DRGs and other aspects of the New Jersey health care system. It is too soon to say whether these new efforts will be more fruitful than previous discussions.

In any event, determining whether reimbursement affects quality, and if so how, may become an increasingly important item on states' agendas, as states are forced defensively to focus on an area that, to date, has not been well understood. The federal government meanwhile may essentially determine the rate at which hospital costs increase--and that rate will be considerably below the historic rates of cost increase that California, New Jersey, and the other states have experienced.

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